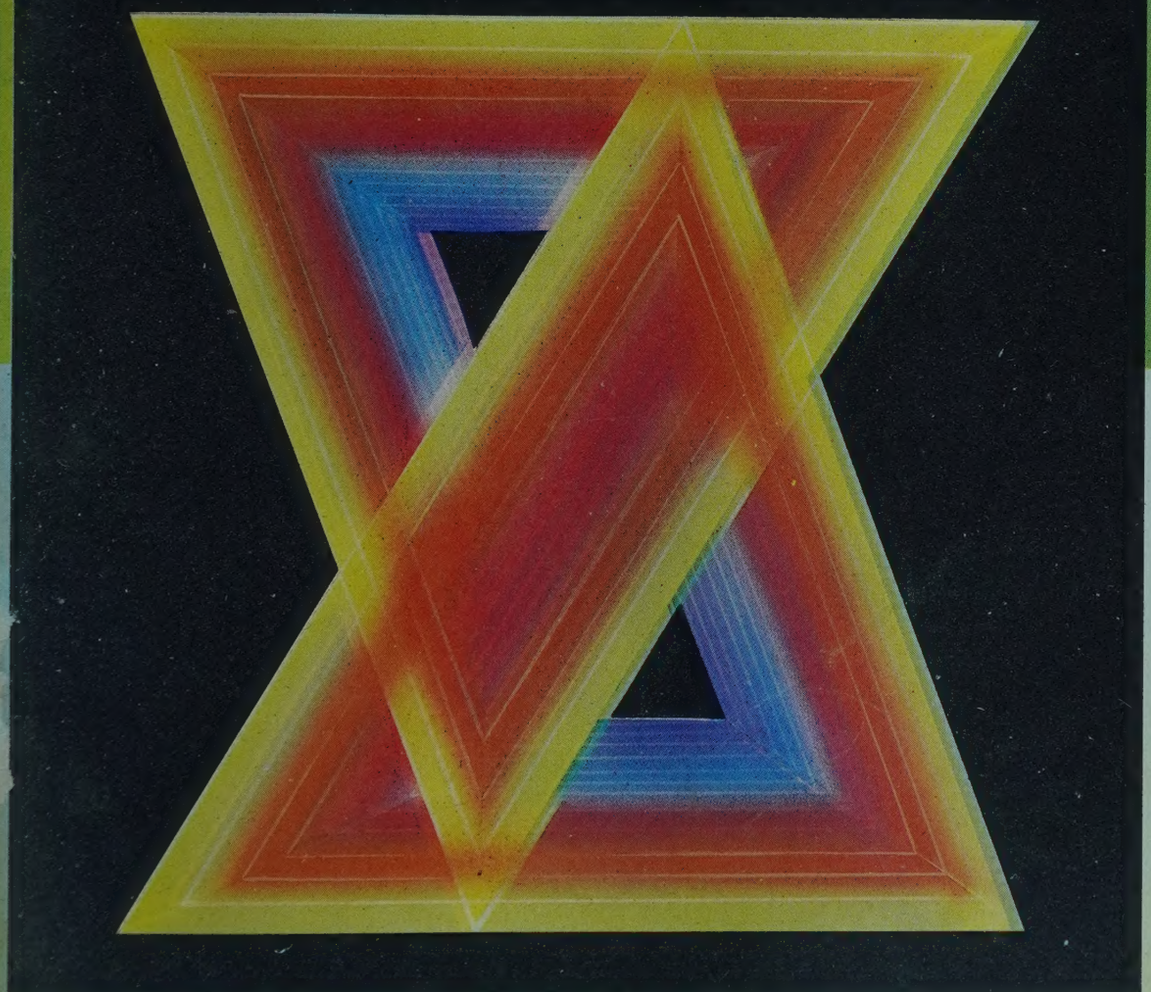
24 MAY 1990
C. I. T. R. I., MYSORE

35th YEAR OF PUBLICATION

Chemical Weekly

VOL. XXXV | MAY 15, 1990 | NO. 36

A Symbiotic Relationship Between Customer and Supplier



Planning together to make sure you get what you need - the way you need it

For all your Ethyleneamines requirements contact us or our Consignee Agents.

DIAMINES AND CHEMICALS LIMITED
International Quality with Indigenous Ingenuity.

Ahmedabad (H.O) : 1, National Chambers, Ashram Road, Ahmedabad - 380 009. Phone : 409626, Gram : DIAMINES
Vadodara (Works) : Plot No. 13, P.O. Petrofils - 391 347. Dist. Baroda. Phone : 73305/406. Gram : DIAMINES Telex : 0175-352 DACL IN.
Bombay Office : 85, 'C' Wing, Mittal Towers, 8th Floor, Nariman Point, Bombay 400 021. Phone : 2029507. Gram : CELAGAR
CONSIGNEE AGENTS :
Bombay : C.K. Patel & Sons, Kamanwala Chambers, 3rd Floor, Sir P.M. Road, Fort, Bombay 400 001. Ph. : 2861190/2860146 Gram : FLYOFF
Delhi : Joshi Associates Pvt. Ltd., 20, Ansari Road, Near Fire Station, Darya Ganj, New Delhi 110 002. Ph. : 263502. Gram : MARTALUMIN.
Bangalore : Masturlal Pvt. Ltd., 7th Mile, Bannerghatta Road, Arakere Village, Bangalore 560 076 Ph. : (812) 641756/640533/641012. Gram : DAKORNATH Telex : 845-2115 FKCI
Calcutta : Alums and Chemicals, 28, Strand Road, 2nd Floor, Calcutta-700 001. Phone : 20-7971/20-5948. Gram : CHEMCENTRE

Navnit/137/90

- Mono Sodium Phosphate Crystal
- Mono Sodium Phosphate Anhydrous
- Di Sodium Phosphate Crystal
- Di Sodium Phosphate Anhydrous
- Tri Sodium Phosphate Anhydrous
- Tetra Sodium Pyro Phosphate
- Acid Sodium Pyro Phosphate
- Mono Potassium Phosphate
- Di Potassium Phosphate
- Tetra Potassium Pyro Phosphate
- Mono Calcium Phosphate
- Mono Ammonium Phosphate Pure
- Di Ammonium Phosphate Pure
- Di Ammonium Phosphate Tech.
- Sodium Acetate Crystal
- Sodium Acetate Anhydrous
- Zinc Acetate
- Lead Acetate
- Potassium Acetate

25 YEARS 1962-87

ACCI

A. CHOKSEY CHEMICAL INDUSTRIES

101, M.G. ROAD, FORT, BOMBAY-400 023.

TELEPHONE : 273868, 274006

CABLE : HEXAPHOS ■ TELEX NO. 11-3716 PHOS IN

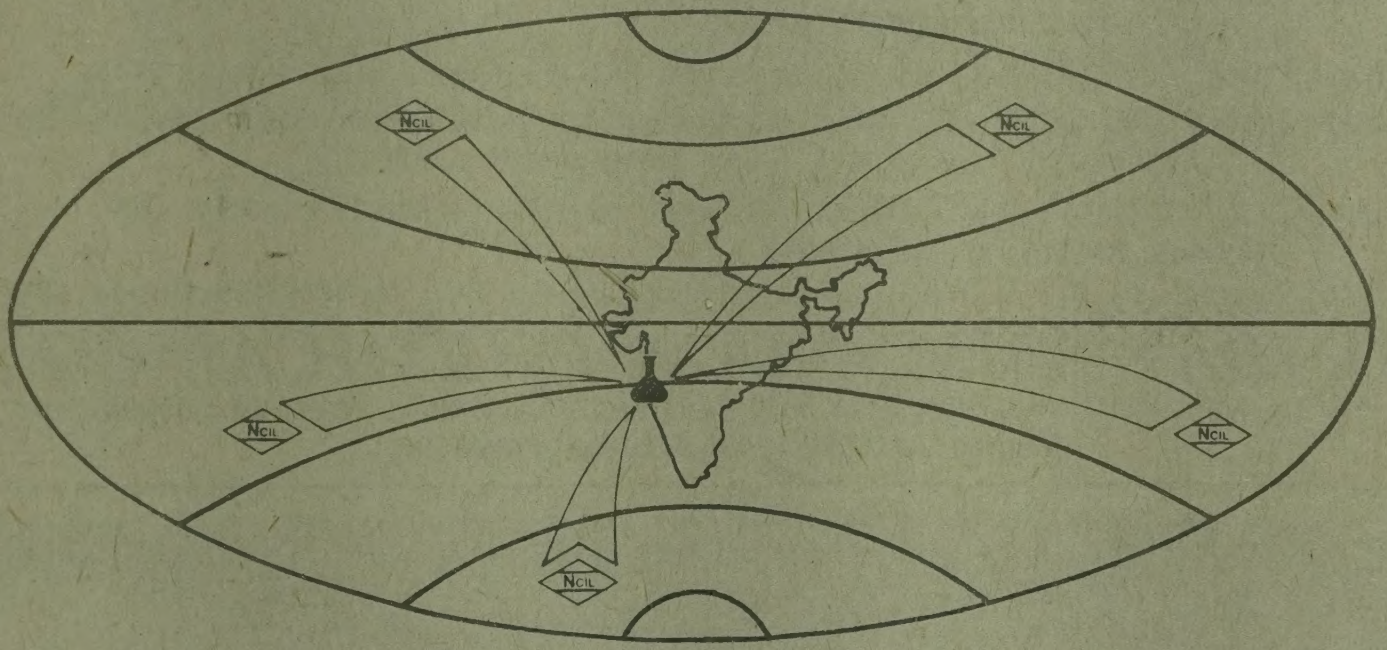
SEE PAGE 39 FOR CONTENTS

ESTD. 1964

Nukem CORPORATION

A Household Name For Methanol, Among The Indian Industries,

Has Now Become An International Symbol For Quality & Service



NCIL

A Commitment to Excellence in Exports

EXPORTS:

★ Bulk Drugs & Pharmaceuticals
★ Dyes & Dyes Intermediates
★ Aromatic Oils & Preparations
★ Herbal Extracts & Preparations
★ Projects & Technology Transfer
★ Bio-Technology

IMPORTS:

☐ Pharmaceutical Raw Materials
☐ Dyes Intermediates
☐ Technology with Plants & Machinery for Import Substitutes in Chemicals & Pharmaceuticals

EXPORT PROMOTION

• Assistance to SSI & Cottage Industry for Initiation into Exports

Contact for further details:

NUKEM
CHEMICAL INDUSTRIES LTD.

Head Office:
Sagar Mandir, Shivaji Park, 5th Road,
Bombay-400 016 INDIA.

Telephones: 456647 • 453096 • 451951
468037 • 468038

Telex : 011-71009
Gram : BROMIN KING
Fax : 00 91 (22) 468680

Please Contact for Prompt Supplies Of:

Anhydrous Ammonia Gas

IN CYLINDERS AND ROAD TANKERS

Also Available LIQUOR AMMONIA in Carboys and Tankers

Surat Ammonia Supply Company

105, Regent Towers, Race Course Circle, Baroda 390 007.
Phones: 323827, 321897 & 320676 * Gram: SASCO * Telex: 0175-497 SASC-IN

Ahmedabad Office: M.H. ENTERPRISES, Plot No. 2018, GIDC, Vatva Phase II, Ahmedabad.
Tel. No. Office: 336279, 348873

Ankleshwar Office: J-3435, G.I.D.C. Estate, Ankleshwar-393 002, Gujarat State. **Phone: 2449.**

Hyderabad Office: SUPERCHEM AGENCIES, Godown No. 1, Behind Bakelite Hylam, Industrial Estate, Sanathnagar, Hyderabad-500 018. **Telephone No. 263812.**

Poona Office: POONA GAS & CHEMICAL CO., Ratnakar, 8/16, Karve Road, Poona 411 004.
Phones: 331110, 331696, 338030.

Vapi Office: Shed No. 19, C-1, B. Type, Vapi Industrial Estate, G.I.D.C., Vapi-396 195. **Phone: 685.**

BOMBAY AMMONIA & CHEMICAL CO.,

204, B-Wing, Neelam Centre, 2nd Floor, Hind Cycle Road, Behind Glaxo, Worli, Bombay 400 025.
Phones: 4948652/4948659/4949544/4946686.

EVERY COLOUR UNDER THE SUN

...TO BRIGHTEN UP YOUR FABRICS

We manufacture Napthols Intermediates under quality control through our R & D Department

1. NAPTHOL AS
2. NAPTHOL ASBS
3. NAPTHOL ASBO
4. NAPTHOL ASOL
5. NAPTHOL ASTR
6. NAPTHOL ASD
7. NAPTHOL ASG
8. NAPTHOL ASSW
9. NAPTHOL ASE
10. PARA NITRO ANILINE (PNA)
11. ORTHO NITRO ANILINE (ONA)
12. ORTHO PHENYLENE DI-AMINE (OPDA)

AND MANY OTHERS...

MANISH

Manish PRODUCTS

Office: 15-A, Haresh Chambers, 3rd Floor,
313-319 Samuel St., Vadgadi, Bombay-400 003, India.
Phones: Off.: 327629, 349605.
Resi.: 6490400, 6494762 Gram: "TAWATA"
Factory: A/80, M.I.D.C. Phase I, Dombivali (East),
Dist. Thana, MAHARASHTRA

Manish

HIGH QUALITY DYES IN A WIDE VARIETY

C

CHANGE OF ADDRESS

WE HAVE SHIFTED OUR OFFICE TO WORLI IN BOMBAY. PLEASE CHANGE YOUR RECORDS TO INCORPORATE OUR NEW ADDRESS, TELEPHONE, TELEX AND TELEFAX NUMBERS AS FOLLOWS:

ADDRESS : 305, B-WING, NEELAM CENTRE,
249-B, HIND CYCLE ROAD,
WORLI,
BOMBAY - 400 025
(Behind GLAXO & Near TV Industrial Estate)

TELEPHONE : OFFICE : 493 7725
493 7726
493 7727
RESIDENCE : 409 3892
407 5245
53 3287

TELEX : 011-73926 CRWN IN

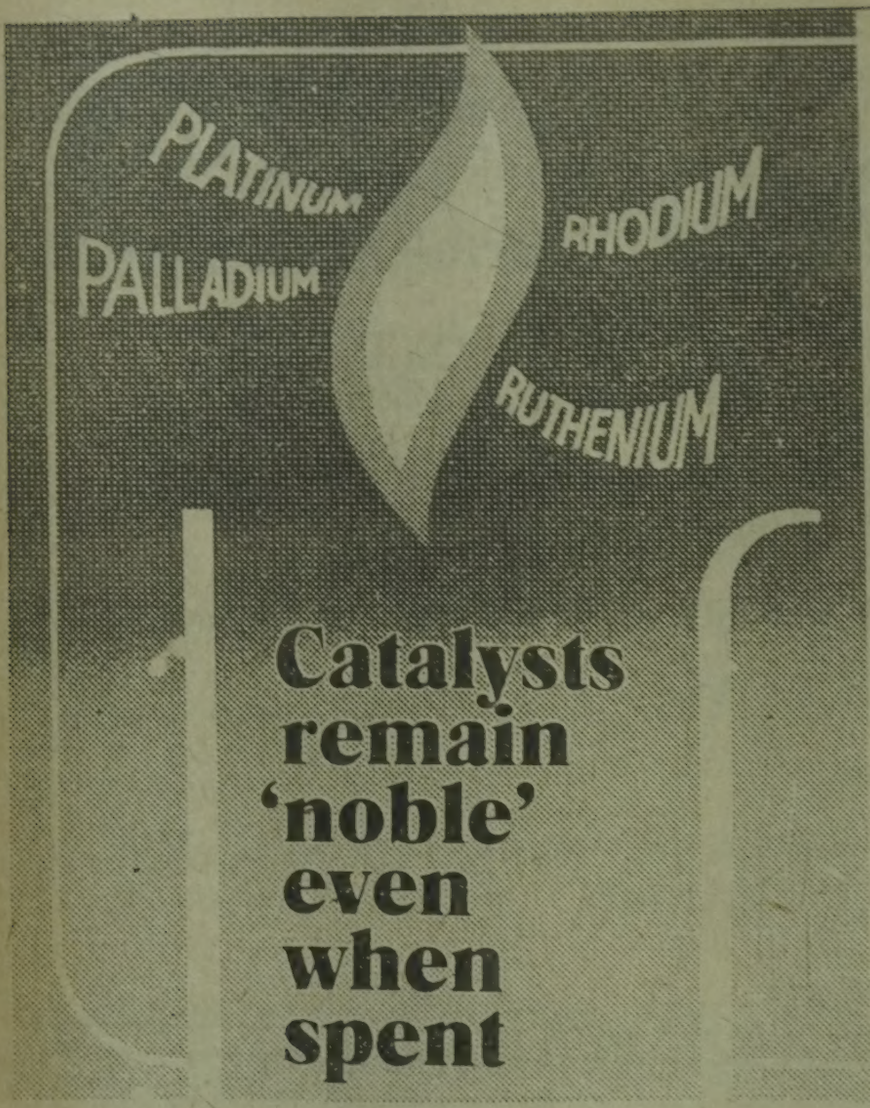
TELEFAX : 2040390

PLEASE CORRESPOND WITH MR. MUKESH KAMDAR/MR. HARISH SHAH

AT

CROWN CHEMICAL PRODUCTS

305-B, NEELAM CENTRE, HIND CYCLE ROAD, WORLI, BOMBAY-400 025



Catalysts remain 'noble' even when spent

And when it comes to recovery there's none quite like us.

We undertake recovery of noble metals from customer's spent catalysts and return them in the form of fresh activated catalysts like 1%, 3%, 5%, or 10% Platinum or Palladium on carriers like activated charcoal, barium sulphate or calcium carbonate or convert them into metals or salts like PALLADIUM CHLORIDE, RHODIUM TRICHLORIDE TRIHYDRATE, CHLORO-PLATINIC ACID, PLATINUM OXIDE (ADAM'S CATALYST)

We also manufacture salts of Silver, Gold and Platinum group metals

- For further details contact:

• parekh platinum pvt. ltd.

- 16B, Samhita Ind. Estate, Off Andheri Kurla Road, Bombay 400 072 INDIA.
- Cable: GOLDMARKET
- Phones: 320675, 344274 5126801, 24798
- Telex: 011-72104 PTRH

RICHARD

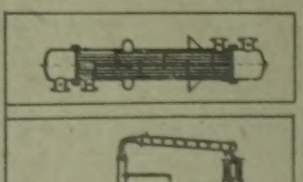
'Just the one you need, A Product of Quality'

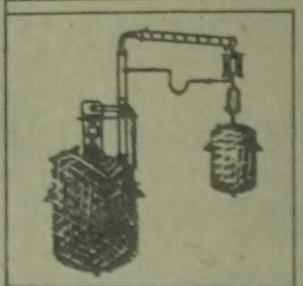
FROM **RICHARD ENGINEERING (BOMBAY) PVT. LTD.**

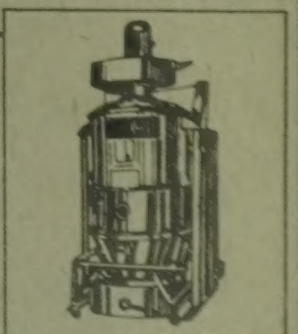
Who have a proven record of our two decades of experience in chemical equipment manufacturing and are known for Quality, Competitive pricing and delivery on time.

Our product range includes.

□ FLUID BED DRYER □ TRAY DRYER □ DRUM DRYER □ FLAKER □ CENTRIFUGE □ LEAF FILTER □ PRESSURE FILTER □ PRESSURE VESSEL □ OPEN REACTION VESSEL □ REACTION KETTLE □ AUTO– CLAVE □ EVAPORATOR □ HEAT EXCHANGER □ DISTILLATION COLUMN □ CRYSTALISER □ BALL MILL □ BLENDER □ GRANULATOR □ STORAGE TANK (M.S., S.S., FR.P., RUBBER LINED, ALUMINIUM AND LEAD BONDING) □ DISH ENDS □ HYDRO GENERATOR, OTHER CHEMICAL EQUIPMENTS







CONTACT

RICHARD ENGINEERING (BOMBAY) PVT. LTD.

Office: 25, M.I.D.C. Chemical Zone, Ambernath, Pincode-421501. Phone: 2513, 2785 Gram: RICHARD
Branch Office: 24, 1st Floor, South Usman Road, T. Nagar, Madras-600017. Phone: 44 33 28
Factory: Plot No. C-10, Lote Parshuram Ind. Area Chiplune, Dist. Ratnagiri. Phone: 79, 279, 278.

NOW AVAILABLE:

96% A.D. DODECYL BENZENE SULPHONATE
(HARD ACID SLURRY)

LINEAR ALKYL BENZENE SULPHONATE
(SOFT ACID SLURRY)

SULPHONATED WITH SULPHUR TRI-OXIDE

MANUFACTURERS:

Arochem Silvassa Pvt. Ltd.,
Industrial Estate, Silvassa-396 230 -- Via Vapi,
Dadra & Nagar Haveli.
Phone: 289, 291 Gram: AROCHEM SILVASSA
Telex: 0185 201 ARCM IN

BOMBAY	:	Scent House, Station Road, Goregaon (West), Bombay-400 062. **Phone: 6722280, Gram: AROSILVASSA, Telex: 011-78077 FAIS IN**
KANPUR	:	Chemdet Enterprises, Shop 67, 75/232, Sabji Mandi, Kanpur. **Gram: SCENTOUS, Telephone: 64551**
MADRAS	:	Syndet Enterprises, 80, Govindappa Naick Street, Madras-600 001. **Gram: SCENTOUS, Telephone: 569032**
DELHI	:	B. Shantilal & Co., 1025/5, First Floor, Gali Teliyan, Tilak Bazar, Delhi-110 006. **Gram: INDOSIL, Telephone: 291 3973/0649**

AVAILABLE REGULARLY

SPRAY DRIED 40%
A.D. ANIONIC DETERGENT
POWDER NEUTRAL-pH: 7-7.5

In Snow White Colour & Free Flowing
Bulk Density below 0.3

Manufacturers

Silvassa Syndet Private Limited

Amli Industrial Estate,
SILVASSA - 396 230 -- Via Vapi,
Dadra & Nagar Haveli
(Phone: 605)

NOW READILY AVAILABLE

SODIUM SULPHIDE

(FLAKES — IRON FREE)

AND

FUMED SILICA

BULK BUYERS PLEASE CONTACT:

M/s. B.S. MEHRASONS PVT. LTD.

B-1/14, Ashok Vihar Phase II,
Delhi 110 052.

Phones: 741742/7118800/2512975/2916979
Telex: 031-78005 PEC IN

M/s. PHARMA CHEMICALS

302, Karsan Natha Trust Building,
330, Samuel Street, Vadgadi,
Bombay 400 003.
Phones: 344115/342889/337417
Telex: 011-73635 BSM IN

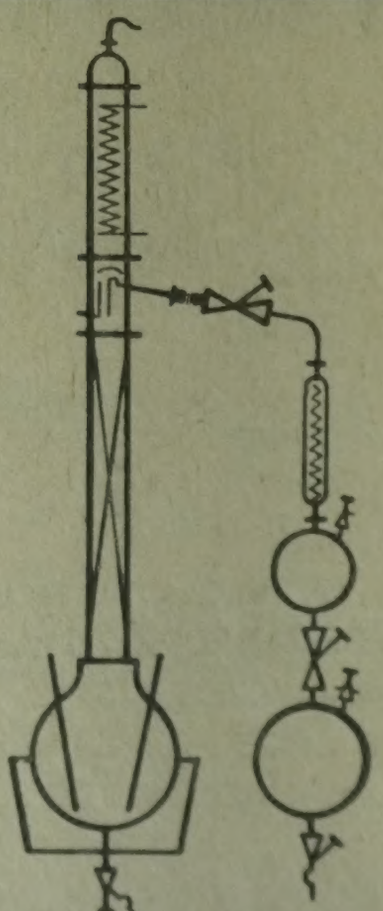
EXTRA STRONG
PROCESS GLASS EQUIPMENT

goel Introduces XTRONG range

OUR PRODUCTS : BOROSILICATE Glass Vessels, Pipe sections, Reducers, Tees, Bends. Valves, Column, Sections, Reflux Dividers, Heat Exchangers, Stirrers, Sight Glasses, Couplings and Teflon items and their installation.

OUR SPECIALITIES :

High Vacuum Reaction & Distillation Units
HCl Absorbption/Generation/Distillation Units,
Pipe Line/Column Components of 9" & 12" Dia.
Liquid/Liquid & Solid/Liquid Extraction Units.



goel scientific works pvt. ltd.
D/35, Sardar Estate, BARODA-390 019.
Ph. : 541692 Tlx. : 0175 565 GOEL IN

AVAILABLE REGULARLY

OXALIC ACID

Please Contact

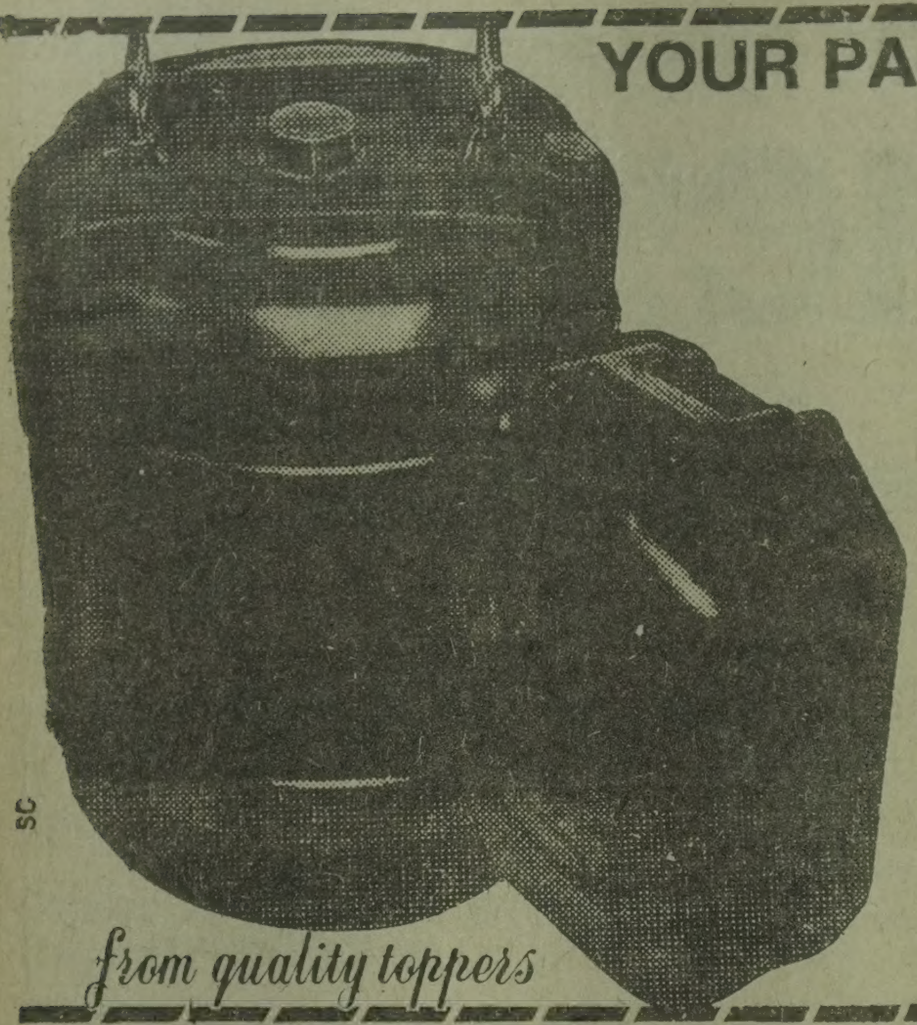
BAJAJ ORGANICS (P) LTD.

102, Yogeshwar, 135/139, Kazi Sayed Street, Bombay 400 003.
Telex: 11-75969 BJAJ-IN **GRAM: CAUSTICLYE**
Phone: 348406/335133/333171 **Resi.: 653581**

Branch Office:

Arunodaya Apartments,
1st Floor,
Room No. J,
7-1-70, Dharam Karan Road, Ameerpet,
HYDERABAD 500 016.
Phone: 228004/36472
Telex: 425-2163 BJAJ IN
Gram: CAUSTICLYE

89, Chandan Society,
Opp. Yashoda Nagar Tekro,
Ahmedabad Bombay Highway,
Yashoda Nagar,
AHMEDABAD.
Phone: 834546



YOUR PACKING PROBLEM IS NOW SOLVED.

Because Reliance Jerrycans & Barrels are manufactured on most sophisticated automatic Blow-moulding Machines with rigid quality control and passing through all kinds of different tests assure you the best guaranteed protection to your precious products.

Reliance
JERRYCANS & BARRELS

from quality toppers

Manufactured by:
RELIANCE PLASTICS
11-A, Unique Industrial Estate,
Opp. Jawahar Talkies, Mulund (West),
Bombay - 400 080.
Phone: 5619994, 5618131 Res: 5613186

SC

For Your Regular Requirements Of:

PETROLEUM ETHER 40°-60°*	German
POTASSIUM CARBONATE*	France
EPICHLOROHYDRINE*	USA
DIMETHYL ACETAMIDE*	German
PIVALOYL CHLORIDE*	France
DIMETHYL FORMAMIDE*	Japan
2-ETHYL HEXANOIC ACID* (Octoic Acid)	Japan
SODIUM METHOXIDE	German
AEROSIL 200	German
METHYLENE CHLORIDE	Holland
CHLOROFORM	Mettur
PYRIDINE 2°	Japan
HYDRAZINE HYDRATE 80%	France
PSEUDOEPHIDRINE	German

* (With MODVAT Benefits)

Kindly forward trade inquiries

HASMUKHRAY & CO.

198, Mangaldas Building No. 3B, Mangaldas Road, Bombay 400 002.
Tel. Nos.: 31-7815/29-2386/25-8137/25-1744 Cable: JAYJANAK Telex: 11-2192 JAY IN
Hyderabad Telephone Nos.: 840408/840356

AVAILABLE AT MOST MOST COMPETITIVE PRICE ON REGULAR BASIS

SULPHURIC ACID 98% - COMMERCIAL GRADE
SULPHURIC ACID - BATTERY GRADE
OLEUM 23-25% AND 65%
CHLOROSULPHONIC ACID
HYDROFLUOSILICIC ACID
SODIUM BISULPHITE LIQUID
ALUMINA SULPHATE LIQUID 8%
ALUMINA SULPHATE - FERRIC / IRON FREE
SULFAMIC ACID
SULFAMIC DESCALANT
DIETHYL SULPHATE
SODIUM SULPHITE
ALPHA OLEFIN SULPHONATES

Manufactured by
The Dharamsi Morarji Chemical Co. Ltd.

GLACIAL ACETIC ACID, N. BUTANOL, ACETALDEHYDE, CAUSTIC SODA LYE, SODA ASH, FORMALDEHYDE, SODIUM FORMATE, GLYCERINE CP/IW, OXALIC ACID, METHANOL, NITROBENZENE, VINYL SULPHONE, GAMMA ACID, S.P.C.P., S.P.M.P., P.M.P., ETHYL ACETATE, BUTYL ACETATE G. SALT AND METHYL BENZOATE MIN. 80%

Please Contact:

UNITED ENTERPRISE

911, EMBASSY CENTRE, 9TH FLOOR,
NARIMAN POINT,
BOMBAY 400 021.

TELEPHONE 204 2584 - 204 7256
230 432 - 230 655

TELEX 011 4353 - TEJU IN

For most competitive quotation, best quality, prompt delivery of

CLOVE OIL (Pharma Grade)
CINNAMON OIL (Pharma Grade)
ANETHI OIL (Pharma Grade)
CASSIA OIL (Pharma Grade)
AJOWAN OIL (Pharma Grade)
ORANGE OIL (Pharma Grade)
CINNAMON LEAF OIL (Pharma Grade)
ALMOND OIL (Pharma Grade)
LEMON OIL (Pharma Grade)

Please Contact Manufacturers:

CHEMICAL PROCESS CONSULTANTS

Unit 202, Adarsh Ind. Estate, Sahar Road, Chakala, Andheri (East), BOMBAY 400 099.
Tel: 6325855 Gram: KEMIPROSS

ATTENTION MANUFACTURERS OF DYESTUFFS, DYES INTERMEDIATES.
BULK DRUGS AND BULK DRUG INTERMEDIATES

Regularly Available on competitive terms

Acetanilide of Ultra Pure Quality
Oxyethyl Nitro Aniline
NN Dihydroxy Metachloro Aniline
N, Methyl-N-Hydroxy Ethylaniline
N, N, Dihydroxy Ethylaniline
N, Hydroxy Ethylaniline
N, N, Dihydroxy Ethyl Meta Toludene

CONTACT MANUFACTURERS:

Vasudha Chemicals Pvt. Ltd.

501, Sai-Ashish, A-Wing, Balrajeshwar Road, Mulund (W), Bombay - 400 080
Tel: 5604382/5603680 Fax: 5603680
Telex: 011-71030 DELT-IN

The Planet Earth is the greatest chemist we know.

What fecund and creative chemistry.
Every human, plant, animal, rock, gas or liquid on earth has a simple or complex chemistry behind it. The idea of so much thought and unconscious formulation seems mind-boggling, but Nature does it regularly and effortlessly.
It inspires us.

Process chemicals for the textile industry for Sizing, Desizing, Mercerising, Scouring, Dyeing, Printing and Finishing.

SUPERTEX®

SUPERTEX®

(INDIA) CORPORATION

132, Dr Annie Besant Road, Bombay-400 018
Phone 493 6041, 493 38 18, 493 5482.
Grams: 'Thinogum'. Telex: 75643.

a M.G. Saraf Enterprise
Most trusted name in chemicals.

FOR SUGAR INDUSTRY AND

All Boiler Tube Cleaning applications

For Your requirements of

AMMONIUM BIFLUORIDE

High purity, manufactured with SWISS collaboration

Please Contact:

Manufacturers:

TAMIL NADU FLUORINE AND ALLIED CHEMICALS LIMITED

Regd. Office:
No. 5-C, 2nd Street,
Dr. Radhakrishnan Road, Mylapore,
MADRAS - 600 004.
Tel.: 846138, 846071. Tlx.: 041-6463 TFAC-IN

Works:
Plot No. 14,
SIPCOT Industrial Complex,
CUDDALORE - 607 003, Tamil Nadu.
Tel.: 2321, 2121. Tlx.: 0462-204 TFCL-IN

Agents

M/s. HINDUSTAN CHEMICAL CO.,
77B, Juhu Supreme Centre,
Gulmohar Road, Bombay - 400 049.
Tel.: 6205464, 6204121

M/s. RANA DYES CORPORATION,
Sringeri Mutt Complex, 1st Floor,
K.V. Temple Street, Sultanpet, Bangalore - 560 053
Tel.: 77417

M/s. RAM-NATH & CO.
123, Angappa Naick Street, Madras - 600 001.
Tel.: 580623, 585843, 837773, 431006
Tlx.: 041-7399 RANA-IN

M/s. DECCAN ORGANICS,
1-8-158/160, Plot no. 10, P.B. No. 1503,
Ptenderghast Road, Secunderabad - 500 003.
Tel.: 844857, 840729. Tlx.: 0425-6535

AVAILABLE IN BULK QUANTITY, BEST QUALITY MATERIAL AGAINST MODVAT FACILITY

1. **FATTY ACIDS:** Oleic, Recenoleic, and other Fatty Acids.
2. **METALLIC STEARATES & PVC STABILISERS:**
   a) ***SOLID:*** TBLS, DBLS, DBLP, L.S., C.S., Lead Complex Stabiliser LI 615 & 612 for Rigid PVC Pipes & Cables.
   b) ***LIQUID:*** Barium Cadmium Liquid Stabiliser & Chelators.
3. **ORGANO TIN STABILISERS:** Toxic, Non-Toxic
4. **RUBBER CHEMICALS:** Zincomat, Thiuram (TMT), S.P., Z.D.E.C., Mentafor-F, Stickex, Rubber Foam Stabiliser.

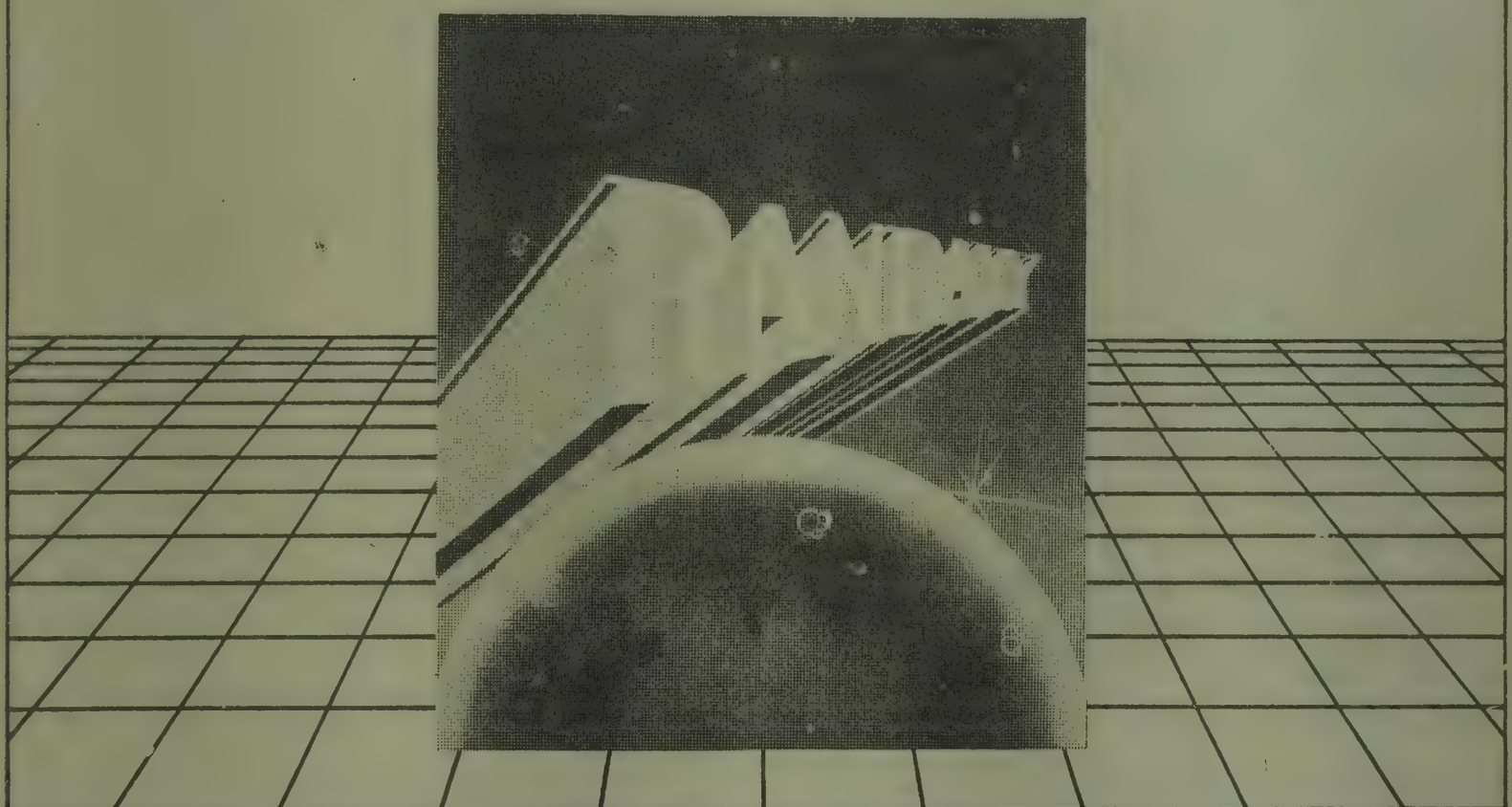
CONTACT MANUFACTURERS

M/s. M.G. CHEMICALS AND OXIDES

G-42, 'D' Wing, Dewan Apts. No. 2, Navghar, Vasai Road (East), Dist. THANA, Pin 401 202
Phone: (02523) 3118 / (02523) 3117
OUR BOMBAY OFFICE ADDRESS:
A-10/3, Indrayudha Hsg. Society, M.G. Road, Goregaon (W), Bombay 400 090 **Phone: C o. 6722018**

Ranbaxy's High-Tech Bulk Drugs

Tested to international standards



No. 1 in exports.

Ranbaxy has achieved the singular distinction of emerging as the largest exporter of bulk drugs from India — A tribute to its quality standards which have been accepted the world-over.

A comprehensive range:

Ranbaxy's bulk drugs include the following products:

1. **Ampicillin Trihydrate IP/BP/USP. (Compacted/Syrup/ micronised)**
2. **Amoxycillin Trihydrate IP/BP/ USP (Compacted/Syrup)**
3. **Cephalexin Monohydrate IP/BP/USP (Compacted/Syrup)**
4. **Chloroquine Phospate IP**
5. **Cloxacillin Sodium IP/BP**
6. **Doxycycline Hydrochloride IP/BP/USP**
7. **Nalidixic Acid IP**
8. **Norfloxacin**
9. **Ranitidine Hydrochloride**

For your requirements, please contact:

RANBAXY LABORATORIES LIMITED

Chemical Division Marketing Office
16, Marina Arcade, Connaught Circus
New Delhi-110001
Phones : 3323738, 3323739
Telex : 031-63487
Cable : RANBAXYLAB
CONNAUGHT CIRCUS, NEW DELHI

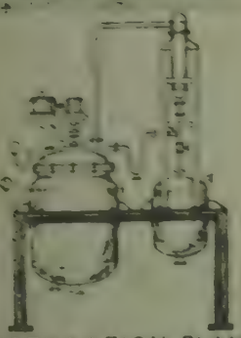
Rated best by every test!

When you are thinking about Chemicals & Pharma Labs-Machineries....

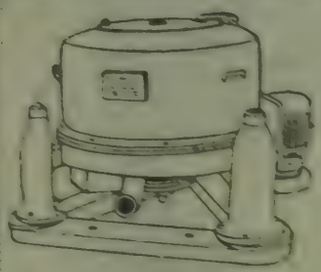
Just have G... at the...

REW

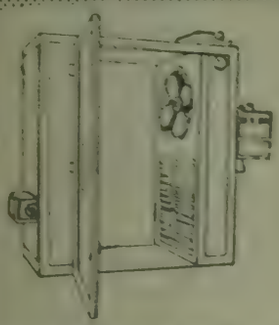
Rajesh



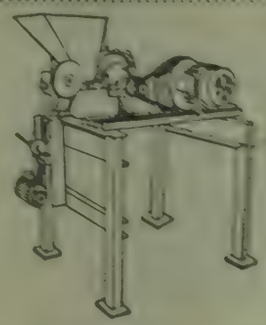
DISTILLATION PLANT



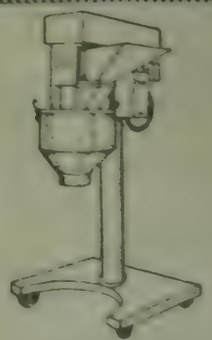
CENTRIFUGE
HYDRO EXTRACTOR.



HOT AIR DRIER



PULVERIZER



MULTI-MILL

the Pioneer Manufacturers
of Chemicals & Pharmaceuticals plant
Dyestuff Machinery Etc.

Manufactured by
RAJESH ENGINEERING WORKS
ASIAN CHEMICAL COMPOUND
SUSHASH NAGAR, JOGESHWARI (E), BOMBAY 40(...
TEL 632514

Design

MANUFACTURERS OF
ACID MILLING DYES

RED RS * RED G * RED GRS * RED 3BN *
PINK R * RED F2R * MAROON V *
NAVYBLUE- S5R * YELLOW 5GN *
YELLOW M * YELLOW N4GN *
GOLDEN YELLOW N2M *
METAL COMPLEX BLACK WA &
DIRECT DYES

chromill colour industries

CHROMILL
COLOUR
INDUSTRIES

INTERMEDIATES
for
DYES Manufacturers

2.5 DICHLORO 1.4 SULFOPHENYL -
3 METHYL 5 PYRAZOLONE *
1.4 SULFOPHENYL 3 METHYL 5 PYROZOLONE *
G-SALT * EBA METASULFONIC ACID. *
PARA AMINO AZO BEZENE SULPHONIC ACID *

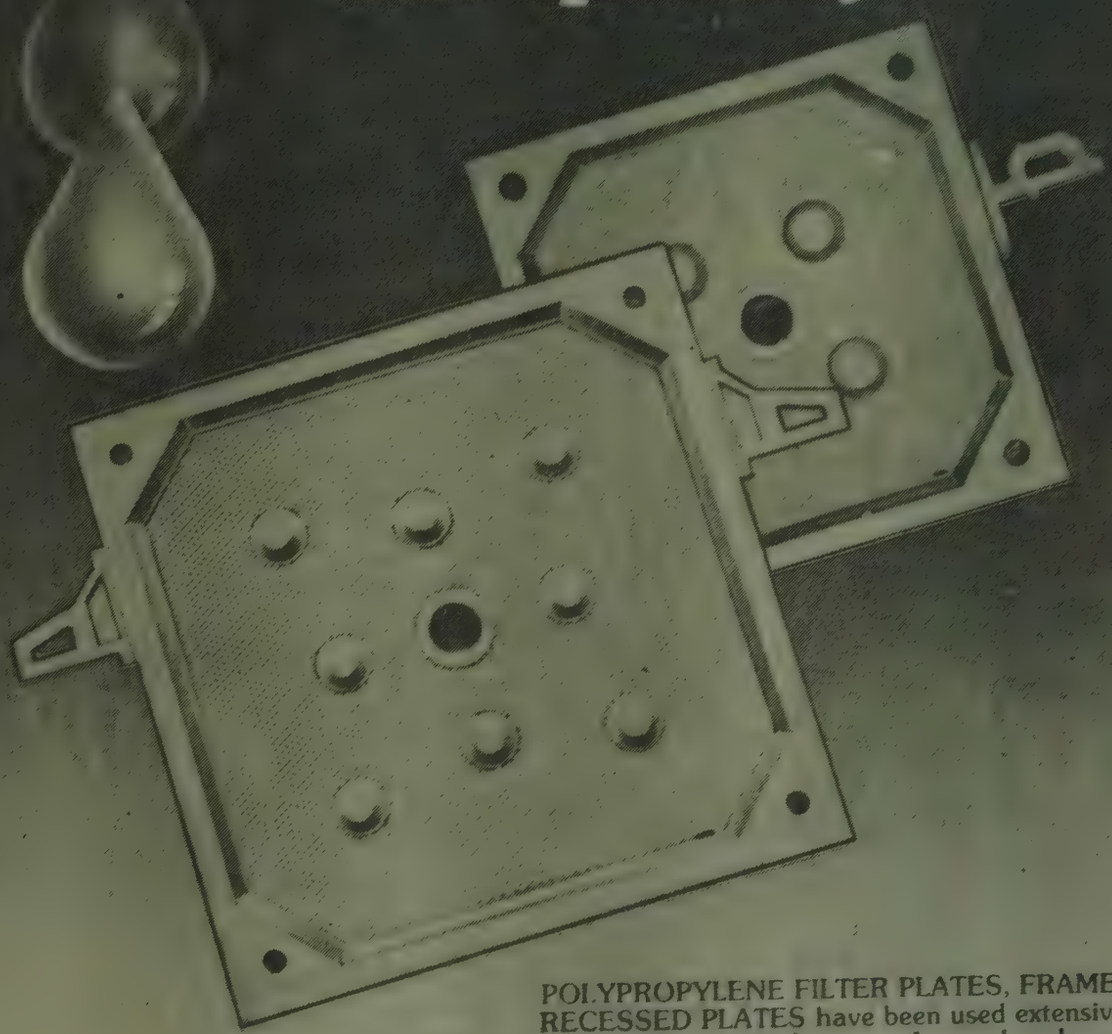
SHIDIMO
INTERAUX
PVT. LTD.

Office: 901-902, Adatia Awas, Bombay Market
Umarwada, SURAT 395 010
Gram: [illegible]
Phone: [illegible]

Factory: [illegible]

Export Inquiries Solicited.

In a world that is hard pressed for quality.

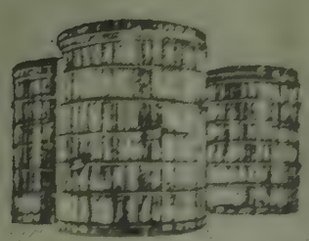


POLYPROPYLENE FILTER PLATES, FRAMES AND RECESSED PLATES have been used extensively in advanced countries for more than a decade.

Experience shows that Polypropylene is an ideally suited material for filter pressing duties.

Advantages

* Light in weight.
* Strong and stable
* Non Corrosive.
* Heat and Chemical Resistant.
* Maintenance Free.



nmp

Wooden Vats
Size 250 litres to 60,000 litres

Widely used in:
Chemical, Pharmaceutical, Metallurgy, Food and Ceramic Industries and also used in clarification of Industrial and Municipal sewage.

POLYPROPYLENE RECESSED FILTER PLATES

AVAILABLE IN A WIDE RANGE OF SIZES TO SUIT ANY FILTER PRESS UPTO 48" (1200 mm.)

M/s. N. M. P. Equipments Corporation.
Near Railway Crossings,
Chimodia naka,
BILIMORA: 396 321. Dist. Valsad.
Tel. No.: 02634 - 2148 (O) 2463 (R)

ATTENTION ► END USERS, EXPORTERS

YOUR SEARCH FOR THE BEST QUALITY OXALIC ACID ENDS HERE!

OVER 99% PURITY

Paschim Chemicals Pvt. Ltd.

Admn Office:
402, Chartered House. 293/299
Dr. Cawasji Hormasji Street,
Marine Lines Bombay-400 002.
Tel 253421, 297158.

Regd. Off:
524, Cotton Exchange
Kalbadevi Road
Bombay 400 002
Tel: 314637

ATTENTION

SCANOMAX INDIA LIMITED

OFFERS

BULK DRUGS & DRUG FORMULATIONS

AT REASONABLE PRICES

- 6 APA
- AMPICILLIN TRIHYDRATE I.P./B.P.
- ATENOLOL B.P.
- AMOXYCILLIN TRIHYDRATE I.P/B.P.
- CEPHALEXIN I.P.
- CLONIDINE I.P.
- MEBENDAZOLE I.P.
- GLIBENCLAMIDE I.P.
- PIROXICAM I.P.
- NIFEDEPINE I.P.
- IBUPROFEN I.P/B.P.
- CLOXACILLIN SODIUM I.P.
- FURSEMIDE I.P.
- CHLORAMPHENICOL I.P.

CONTACT

SCANOMAX INDIA LIMITED

Admn. Office.
2504, Sector 35-C
CHANDIGARH.
Phone : 43058
Telex : 395 237 PIDL IN

Flat No. 916, 9th Floor
Himachal Building
Barakhambha Road
NEW DELHI

BRANCH OFFICES

184, Poonamallee High Road,
Post Box No. 1006,
MADRAS-600 010

Works.
Vill. Channo,
23 KM Stone on
Patiala Sangrur
Highway, Distt.
SANGRUR. (PB.)

4-B, Little Russell Street
CALCUTTA-700 071

If the history of planet Earth can be seen as 1 day, then,

1) The Human species arrived only 10 minutes ago.
2) Civilization is only 5 seconds old.
3) The Industrial Revolution only 1/8th of a second.
Yet so much has been achieved in 1/8th of a second.

Superchem making the most of 1/7th of 1/8th since we arrived 'only' 30 + years ago;

Process chemicals for the textile industry for Sizing, Desizing, Scouring, Mercerising, Dyeing, Printing and Finishing.

SUPERCHEM®

SUPERCHEM®

132, Dr. Annie Besant Road, Bombay-400 018
Phone: 493 6041, 493 38 18, 493 5482.
Grams: 'Thinogum'. Telex: 75643.

a M.G. Saraf Enterprise
Most trusted name in chemicals.

For Your Small & Bulk Requirements Of:

Morpholine * Phosphorous Trichloride * Tributyl Phosphate
Phosphorous pentoxide * Phosphorous Oxychloride
Mono Ethanolamine * Tri Ethanolamine * Diethanolamine

PLEASE CONTACT:
S.I. CHEMICALS & TRADING CO. PVT. LTD.
65, Bombay Samachar Marg, Sonawala Building, 2nd Floor, Bombay - 400 023
Phone: 286 34 18, 286 12 36. Cable "SICORPOBOM" Telex: 11-5028 CHEM-IN

FOR YOUR BULK REQUIREMENTS OF:
T.R.O.(Turkey Red Oil)
Sodium Lauryl Sulfate
Sodium Lauryl Ether Sulfate
Triethanolamine Lauryl Sulfate
TEBA (Phase Transfer Catalyst)
Please Contact Manufacturers:
SWAPNA CHEMIE
25/160, D.N. Road, Fort, Bombay 400 001.
Telephone: 2047713
OTHER PRODUCTS OFFERED: TRIACETIN, CABS

QUALITY SOLVENTS
Ethylene Dichloride 250 Kg. HDPE Drum Packing Formaldehyde 220 Kg. HDPE Drum Packing
TRIETHANOLAMINE DIETHANOLAMINE MONOETHANOLAMINE
ETHER PETROLEUM 40-60/60-80/80-100/80-120/90-100/100-120
OLEIC ACID TECH. 180 Kg. Packings

AMYL ACETATE
BUTYL CELLOSOLVE ACETATE
BUTYL CARBITOL ACETATE
CELLOSOLVE ACETATE
MONOCHLORO BENZENE
TRICHLORO BENZENE
PARA DICHLORO BENZENE
CARBITOL ACETATE
ISOPROPYL ACETATE
METHYL ACETATE
OCTYL ACETATE
ORTHO DICHLORO BENZENE
ISO AMYL ALCOHOL

Chemical Solvent Centre
43, Princess Street 3 Devkaran Mansion, 1st Floor, Bombay 400 002.
Office: 314293 • 313812 • 254853 Resi.: 354061
Gram: CHESOLVECE • Telex: Asim 011-73145

Where Quantity & Quality Matter always Count on....

KC KRIPA'S

ACID SLURRY

SODIUM LAURYL SULPHATE
(POWDER, NEEDLES & LIQUID)

SODIUM LAURYL ETHOXY SULPHATE

INDUSTRIAL DETERGENT 40%
(SPRAY DRIED WHITE POWDER)

KC KRIPA'S

KRIPA CHEMICALS PVT. LTD.

Admn. Office:
8/9/10 'Royal Chambers'
S. No. 47, Paud Rd., PUNE-411038
Phones; 333245, 331825, 331855
Telex: 0145-729 KRIPIN

Branch Office:
House No. 1024, 10th Main Road,
West of Chord Road, IIIrd Stage, 1st Block,
Bangalore-560079 **Phone: 357393**

PRINT-DESIGN

For Your Requirements Of:

AMMONIUM MOLYBDATE (99.9% PURE) SODIUM MOLYBDATE (ASSAY 99%)

CADMIUM -- CHLORIDE/SULPHATE/CARBONATE/OXIDE/NITRATE
BISMUTH -- NITRATE/OXIDE/CITRATE/SUBCARBONATE/OXYCHLORIDE/SUBNITRATE
COBALT -- NITRATE/CARBONATE/ACETATE/CHLORIDE/SULPHATE/OXIDE/OXIDE BLACK
NICKEL -- CARBONATE/NITRATE/OXIDE/SULPHATE
POTASSIUM -- IODIDE/IODATE

EDTA DI SODIUM SALT

Contact Manufacturers

MONARCH CHEMICAL INDUSTRIES

Admn. Office: 25, Old Sattagali (Kaviniray Gali), Tarachand Ghanshyamdas Bldg.
1st Floor, Sheikh Memon Street, Bombay 400 002.
Phones: Office: 318998/319814 Resi: 8129380/8127641

FOR YOUR REQUIREMENTS OF:

FURAZOLIDONE BP
SODIUM SACCHARINE IMP.
INDOMETHACIN BP/USP
LACTIC ACID BP/USP (IMP)
PROPIONIC ANHYDRIDE
DIMETHYL ACETAMIDE
DIMETHYL CARBONATE
2,6-LUTIDINE
DIMETHYL DICHLORO-SILANE

DIETHYL CARBONATE
B-HYDROXY ETHYL HYDRAZINE
L-LYSINE HCl (Pharma)
5-NITRO-2-FURFURALDEHYDE DIACETATE
PIVALOYL CHLORIDE
GUM ROSIN
AMINOPHYLLINE
FAST GARNET GBC BASE

PHOTOGRAPHIC GRADE

SODIUM THIOSULPHATE (EX)
SODIUM CARBONATE (EX)
POTASSIUM META BISULPHITE
SODIUM SULPHITE
SODIUM METABISULPHITE
HYDROQUINONE

CONTACT:

M/s. KIRAN CHEMICALS

178, Sant Tukaram Road, First Floor, BOMBAY 400 009.
Phone: 8512053/8517313/8728929 Resi.: 4076078/4078231/4077254/4075799

For your Requirements of:

EDTA, NTA and their Salts

Used in Agriculture, Textile, Rayon, Soaps and detergents, Rubber, Paper, Leather, Pharmaceuticals, Electroplating, Photography, Water-Softening, Paints, Plastics, Resins, Cosmetics and Various other Industries as Chelating / Sequestering / Metal Complexing Agents.

please contact manufacturers :-

CHEMOFINE INDUSTRIES

138, MADHANI ESTATE, 542, SENAPATI BAPAT MARG,
DADAR (W), BOMBAY: 400 028. (Factory at Chembur, Bombay.)
Tel. Office: 4229932. Residence: 4220392.

Available in Bulk Quantity and ready stock

FRUSEMIDE I.P./B.P.
FENBENDAZOLE
PENTOXYPHYLLINE
16 D.P.A.
FRUSEMIDE TABLETS
- TRUSEX -
C.P. MALEATE
5 CHLORO SALICYLIC ACID

(for export)

DIMETHYL AMINO ETHYL CHLORIDE HCL

WANTED LOCAL AGENTS/STOCKISTS IN UNREPRESENTED AREAS

TRANSCHEM PVT. LTD.

56, Ridge Road, Malbar Hill, BOMBAY 400 006.
Phone: 8123636 - 8128608 - 8117511 - 8113334

FOR YOUR REQUIREMENTS OF:

* Vinyl Sulphone Dyes -- Turquoise Blue G
* Reactive Turquoise Blue H5G, H7G, H2G
* Reactive Navy Blue HR
* Direct Turquoise Blue

FOR EXPORT
CI BLUE -- 21
CI BLUE -- 25
CI BLUE -- 59
CI BLUE -- 86

Contact Manufacturers:
AT BOMBAY OFFICE:

BLUESTONE DYE CHEM INDUSTRIES

Office:
77/87, Abhechand Gandhi Marg,
Shreeji Krupa Building
Room No. 19, 2nd Floor, Bombay 400 003.
Phones: 342466/324526, C/o. 345512, Resi.: 5610860

Factory:
Shed No. C-1/B-3, G.I.D.C., Vapi
Dist. Bulsar, Gujarat. Pin 396 195
Phone: 837.
(Export enquiries also solicited)

Associated Concern: KUSUM DYE CHEM INDUSTRIES
Plot No. 303/8/D, G.I.D.C., Vapi, District Bulsar, Gujarat Pin 396 195

FOR YOUR REQUIREMENTS OF

Ammonia Gas
Ammonia liquor

PURITY 99.5% IN CYLINDERS OF 40 & 50 KGS ROAD TANKERS OF 5, 6, 7 M.T. SPECIFIC GRAVITY 0.910 & 0.888 IN ROAD TANKERS, 7-9 M.T. DRUMS, CARBOYS & BOTTLES

Please Contact: ASCO CHEMICAL COMPANY

61, Bombay Talkies Compound, Post Box No. 17629, Malad (West), Bombay 400 064.
Tel.: Off.: 6820151/6821667/692233; Resi.: 6265775; Gram: "PAGODA" Malad, Bombay 64.
Factory: Plot No. 4, Mira Co-op. Industrial Estate, Mira, Dist. Thane. Telephone: 663691
And Also Available At Ankleshwar (Guj).

ANKLESHWAR AMMONIA SUPPLY CO.

Plot No. 6508, GIDC, Ankleshwar, Gujarat.
ANKLESHWAR: (M. STD CODE No. 0264622) Tele.: 3010

For Your Requirements Of:
High Purity Laboratory Liquid Reagents Of LR./AR./EL. Grade

* ACIDS
* AMMONIA SOLUTION 0.91/0.88
* SOLVENTS
* HYDROFLUORIC ACID 40% & 48%

& Wide Range of Liquid Reagents etc.

Contact Manufacturers:

BDI BHARAT DYE-CHEM INDUSTRIES

Office: Mangaldas Building, No. 1, Room No. 46, 2nd Floor, Mangaldas Road,
Princess Street, Bombay-400 002
Works: W-243-A, M.I.D.C., Rabale Village, Near Pipe Line Road,
Thane Belapur Road, Thane (Maharashtra)
Tel. Office: 235632, 251213
Residence: 5129715, 5133549
Works: (STD 0215) 2807
Cable: MAITRI-BHAV

Connected to one of the oldest industries in the world, which incidentally is also the youngest.

From ancient garments made of bark and hide, through historical finds of Chinese silk and Egyptian cotton at burial sites, to modern fabrics made on computerized looms, humankinds relation with clothes are as old as civilization. From the time when lamp-black, powdered lapis lazuli, red ochre, dye secretions of the banded murex snail, indigo and other plant, mineral and animal dyes have been used, human facination with colouring agents is also well known.
We at Texchem continue this oddyssey, this quest for cloth and its colour.

Process chemicals for the textile industry for Sizing, Desizing, Scouring, Mercerising, Dyeing, Printing and Finishing.

TEXCHEM®

TEXCHEM®

182, Dr. Annie Besant Road, Bombay-400 018
Phones: 493 6011, 493 38 18, 493 53 [illegible]
Grams: Thangam Telex [illegible]

a H. G. Saraf Enterprise
Most trusted name in chemicals.

ALWAYS AVAILABLE

HYFLOSUPERCELL	MELAMINE	LITHOPONE
DICALITE	PHENOL	HYDROGEN PEROXIDE
CITRIC ACID	PARAFORMALDEHYDE	FORMIC ACID
PECTIN	BUTYL ACRYLATE	TARTARIC ACID

Phone:
Resi: 6442063
Office: 320343/347879

Please Contact:
B.I. MEHTA

Telex No.
C/o. 11-75617 MMCB IN
Fax: 00-91-22 325620
Attn.: B.I. Mehta

2-B, Ganga Vihar, 94, Kazi Sayed Street, Bombay 400 003.

WE ALSO BUY/SELL REP-EXPORT HOUSE LICENCE

Introducing for the first time in India

Anatto Colours [Natural Colour]
Available food Colours-Tartrazine, Carmoisine
Brilliant Blue FCF, Sunset Yellow FCF.
Brilliant Blue FCF Special Supra (ISI)

Fast Green FCF (ISI), CI 42053. Suitable for bright black & brown Available in Lake Form and Special colours for Capsules and cosmetics.

Also available Alizarine Cyanine Green F, Colour Index No. 61570 Eosine and Acid Yellow 73 (Uranine)

Solicit your Enquiry for Food Colour Mixtures, Pea Green, Black, Chocolate Brown etc. and also for Lake Colours

NECOL

Neelikon Dyestuffs.

204, Dr. D.N. Road, National Insurance Bldg.,
First Floor, Bombay 400 001. Tel.: 204 53 22

AMMONIA

Gas

Liquor

Purity-99.5%
In Cylinders of 40 kg./50 kg.
In Tankers of 500 kg.
In Road Tankers of 5, 6, 6.5 M.T

Sp. Gravity 0.910 & 0.888.
In Road Tankers, Drums & Carboys

Please Contact:

JAYSONS CHEMICAL INDUSTRIES

SAKI VIHAR LAKE ROAD, POST BOX NO. 8968, SAKINAKA, BOMBAY - 400 072

Phones: 582704/589205/589208

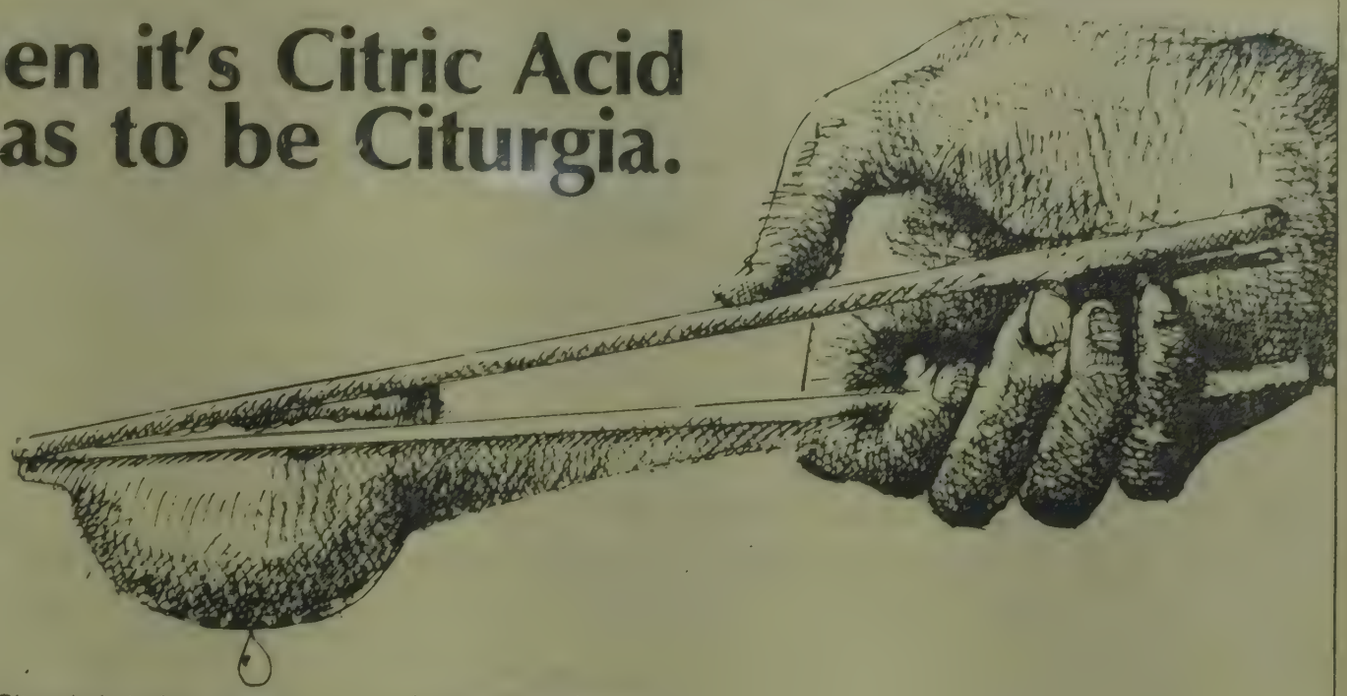
Grams: JAYSONS--Bombay-400 072

261, Kandla Kashan Street,
Delhi-110 006
Phone: 235516
Gram: 'JAYCI'

BRANCHES
Plot No. 317/7, G.I.D.C.,
Vapi, Dist. Bulsar-396 195
Phone: 1689

18-A, Mai Krupa Society,
Old Channai, Highway Road,
Baroda
Phone: 22161

When it's Citric Acid it has to be Citurgia.



The name Citurgia is today synonymous with Citric Acid of the finest quality. Citurgia caters to more than just one need in more than just one industry. Besides the traditional usage of Citric Acid in food, soft drinks, confectionery and drugs, today the uses of Citric Acid extend to new areas:

* In the textile printing and dyeing industry it provides 'STABLE pH' conditions for polyester and nylon. As also for acrylic prints curing and cotton-resist printing. Citric Acid has successfully replaced imported Tartaric Acid because of its excellent quality, low costs and easy availability. Also, it is a very safe acid compared to other organic and inorganic acid salts.
* Citric Acid prevents flavour deterioration, rancidity and discoloration in edible oils.
* It imparts an acidic taste to dry powdered drinks.
* It is also used as a descaling solution.

Citurgia Biochemicals Ltd. is the largest producer of high quality Citric Acid in India. Besides catering to the domestic demand, Citurgia's Citric Acid is exported to USA, Japan, Germany, Australia, Iran, Malaysia, Sri Lanka and other countries.

Citurgia Citric Acid India's No.1

CITURGIA BIOCHEMICALS LIMITED

Regd. Off. Neville House, J.N. Heredia Marg, Ballard Estate, Bombay 400 038.
Tel. 2618071 Gms. CITURGIA BOMBAY

Tlx : 11-73372 BDM IN

Available From Ready Stock:
IN SMALL PACKING OF 450 ML/5 Lit/30/35 Lit & 50 Lit/Kg.

Acetone
Amyl Acetate
Acetic Acid Glacial
Aniline Oil
Butyl Alcohol - N
Butyl Acetate
Benzene (N.G.)
Carbon Tetra Chloride
Chloroform
Cellosolve
Cyclohexanone
Di Acetone Alcohol
Di Butyl Phthalate
Di Octyl Phthalate
Di Ethanolamine
Di Ethylene Glycol
Di Methyl Formamide
Epichlorohydrine
Ether Petroleum (40/60)
Ether Petroleum (60/80)
Ether Petroleum (80/100)
Ether Petroleum (100/120)
Ethyl Acetate
Ethylene Glycol
Ethylene Di Chloride
Formaldehyde 37%
Glycerine
Iso Propanol
Liquid Paraffin Light
Liquid Paraffin Heavy
Methyl Ethyl Ketone
Methyl Iso Butyl Ketone
Methylene Chloride
Mono Chloro Benzene
Mono Ethanolamine
Mineral Turpentine
N. Hexane
Octyl Alcohol
O.D.C.B.
Oleic Acid Commercial
Oleic Acid Pure
Pine Oil
Perchloro Ethylene
Propylene Glycol
Phosphoric Acid
Poly Glycol 400
Potas Hydroxide Pellet
Solvent Naphtha Heavy
Sorbitol
Solvent Naphtha Light
Silicone Oil (All Grades)
Silicone Grease
Sodium Silicate Natural
Styrene Monomer
Trichloroethylene
Toluene (N.G.)
Tri Ethanolamine
Trichloro Benzene
o.Xylene

Please Contact:
MEMBA CHEM CORPORATION
19, M.J. Co-op. Housing Society Ltd., Ground Floor, 187, Shamaldas Gandhi Marg (Princess Street), Bombay 400 002.
Phone: 316261/252255

Available regularly:

BISPHENOL
CETOSTEARYL ALCOHOL
CETYL ALCOHOL
DICYANDIAMIDE
EPICHLOROHYDRIN
2 ETHYL HEXYL ACRYLATE
ISO PROPYL ALCOHOL
LITHIUM CHLORIDE
LAURYL ALCOHOL
LACTIC ACID 80% & 88% (USP)
POTASSIUM FERROCYANIDE
SODIUM LAURYL SULPHATE
SODIUM FORMATE
TERTIARY BUTANOL
TRIETHYLENE GLYCOL

Please Contact:
CHEMICAL CORPORATION
340/42, Samuel Street, Raut Chamber, 4th Floor, Bombay 400 003.
Phones: Off.: 333601, 333602, 347262 Resi.: 352625, 364354 Tlx.: 011-73145 ASIM IN Fax: 91-22-331738

FOR YOUR REGULAR REQUIREMENTS OF:
AMMONIUM CHLORIDE I.P.
(With MODVAT Benefits)
Manufactured By: M/s. PRECISE INDUSTRIES - NASIK
Contact:
SOLE SELLING AGENTS FOR MAHARASHTRA
M/s. PIONEER CHEMICAL INDUSTRIES
104, Giriraj, 73, Sant Tukaram Road, Bombay 400 009.
Tel.: 298821/253038
EXPORT ENQUIRIES SOLICITED.
ALSO AVAILABLE FROM READY STOCK
POTASSIUM CHLORIDE I.P. * CETOSTEARYL ALCOHOL - HENKEL
L-LYSINE HCl - Pharma Grade * SODIUM HYDROXIDE PELLETS - Pharma
POTASSIUM HYDROXIDE PELLETS - Pharma
CHLOROFORM BP/USP - CWH. (W. Germany) * S.L.S. NEEDLE - HENKEL

AMINES
PLASTICIZERS

Manufacturers of

Monoethanolamine
Diethanolamine
Triethanolamine (85%)
Triethanolamine (Pure)
Di-Octyl Maleate
Di-Octyl Phthalate
Di-iso-Octyl Phthalate
Di-iso-Decyl Phthalate
Tri-Octyl Tri Mellitate
Butyl Benzyl Phthalate
Morpholine

COMPRESSED OXYGEN — In 7 Cu. M. Cylinders.
COMPRESSED NITROGEN — 550 Cu. M. Trolleys & 1200 Cu. M. Truck-Mounted Skids.
DISSOLVED ACETYLENE — In 5.8 Cu. M. Cylinders

For Your Requirements Contact:

AMINES & PLASTICIZERS LTD.

6th Floor 'D' Shivsagar Estate,
Dr. Annie Besant Road, Worli,
Bombay-400 018.

Phones: 4935282/87/88

Readily Available

DI-ETHYL OXALATE

Contact Manufacturers:

ORTHO ESTERS

General Assurance Building, 232, D.N. Road, 3rd Floor, Fort, Bombay 400 001.
Telephone No. 204 5154 and 204 2398

Also Offering

*** DYFINISH KVS * DYZOL TF**
*** TEXTILE CHEMICALS / AUXILIARIES**
*** ACETIC ACID GLACIAL 98/99% * 'NPL' HYDROGEN PEROXIDE 50%**

FOR QUALITY PRODUCTS AND COMPETITIVE RATES

DI BUTYL PHTHALATE (D.B.P.)
DI OCTYL PHTHALATE (D.O.P.)
DI OCTYL SEBACATE (D.O.S.)
DI BUTYL SEBACATE (D.B.S.)
BUTYL STEARATE
DI OCTYL MALEATE (D.O.M.)
DI BUTYL MALEATE (D.B.M.)
DI OCTYL ADIPATE (D.O.A.)
DI BUTYL ADIPATE (D.B.A.)
OCTYL ACETATE
OCTYL STEARATE

CONTACT MANUFACTURERS

ENBICHEM INDUSTRIES

219/224, Madhani Estate, 542, S.B. Marg, P.B. No. 7039
Dadar, Bombay - 400 028.
Phone: 4225392 / 4228968

FOR YOUR REGULAR REQUIREMENTS OF:

BON ACID

(Manufactured By : NEWPAR AROMATICS P. LTD.)

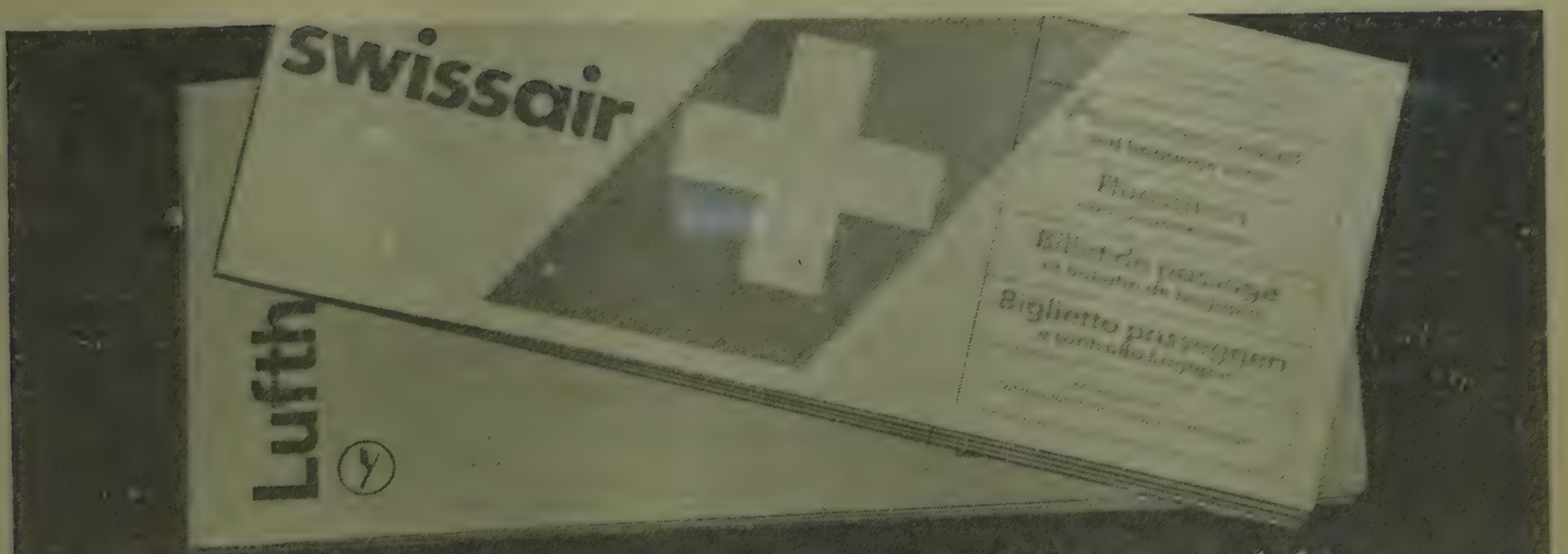
Please Contact:

P.D. SALES CORPORATION

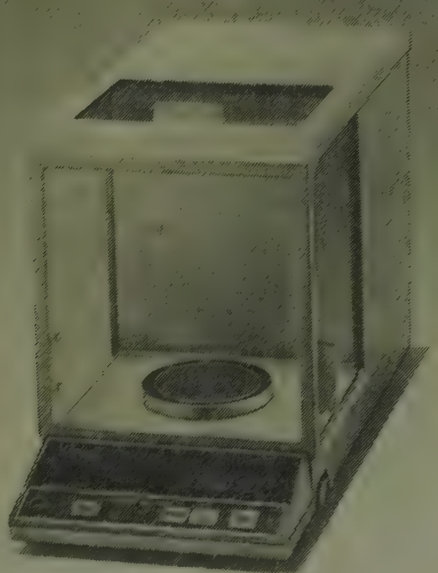
206/A, Matru-Chhaya,
378/80, Narshi Natha Street, Bombay 400 009.
Phone: Off: 347430 **Res: VIRESH METHA 5617576**
PRADIP SHAH 5139539

WE ALSO OFFER

2:5 Dichloro Aniline (Fast Scarlet GG Base) * Meta Chloro Aniline



This is what you may need if something goes wrong with your imported electronic balance.



A ticket to Switzerland. Or is it Germany? Because if you've bought an imported balance, chances are you won't get the service when you need it most. So don't fall for the temptation of foreign brand names, or cheap bargains.

Look beyond the label and the price...
Look at what Afcoset offers

Technology that's state-of-the-art. Design that's sleek and sophisticated. Performance that's world class.

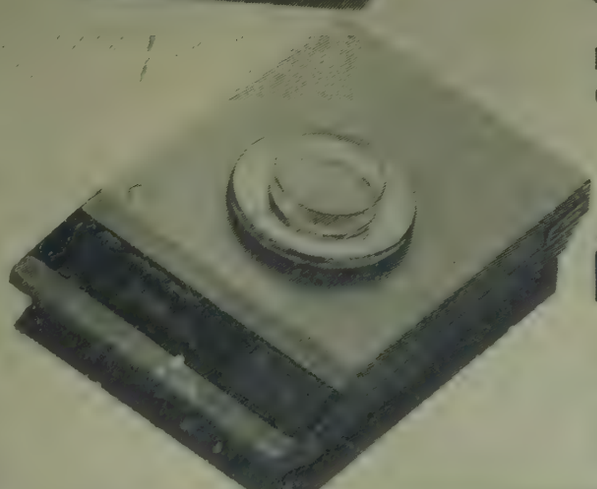
Afcoset in collaboration with A&D, Japan, offers you the widest range of high-precision balances, manufactured right here in India, at our own sophisticated factory.

Every Afcoset balance is put through innumerable rigorous tests before it's ready to take on the demanding challenges of high-precision weighing.

You have our support at all times...

At Afcoset, we go beyond merely "supplying" you with a machine. We'll give you all the back up and support, should you ever need it. In quick time.

After all, we're not just traders but have a long-term commitment to the industry.



Afcoset
BALANCES
Licence A&D, Japan

The Bombay Company Ltd.
334, A to Z Industrial Estate,
G. Kadam Marg, Lower Parel, Bombay 400 013
Tel: 4938218/19 Tlx: 011-76779 DPIL IN

For Pharmaceutical Industries

PETROLEUM BENZINE (PETROLEUM ETHER) 40°-60°/60°-80°/60°-95°
HEXANE 65°-70° EMULSIFYING WAX

For Paint/Pesticide/Agro/Rubber Industries

PETROLEUM BENZINE (PETROLEUM ETHER) 80°-100°/80°-120°/90°-100°/100°-120°

AMYL BUTYRATE ETHYL BUTYRATE
SCHAEFFER'S ACID (AS SODIUM SALT) (Export Enquiries Solicited)

Contact Manufacturers

STERLING ORGO & INORGO CHEMICALS P. LTD.

Regd. Office: 340-42, Samuel Street, Raut Chamber, 4th Floor, Bombay 400 003.
Phones: 333601/333602/338722 Telex: ASIM IN 73145 Fax: 331738
Factory: Plot AF-1, Cama Industrial Estate, Walbhat Road, Goregaon (East), Bombay 400 063.
Phone: 6730458/6734593/6734650 Resi.: 352625/364354/8114061

We are pleased to offer our own

TOLUENE

(Nitration and Pure Grade)
(in barrels or bulk)

To actual consumers having all valid licences.

Kindly write with full details to:

M/s. SAVIORAY LABORATORIES PVT. LTD.

Post Box No. 5527,
Dadar, Bombay 400 014.

- POLINOL–205 (against Unitika Up–050G) For 'O' Filament Spring Yarn
- POLINOL–117 (against PVA–173)
- POLINOL–217 (against GH–17)
- VINYL ACETATE MONOMER
- STYRENE MONOMER
- ACETIC ACID 98% & 70%
- POLY–VINYL ACETATE EMULSION (POLYSOL–P5)
- CMC, ALGINATE, GLYOXAL 40%
- SULPHURIC ACID 98% & 70%
- MCA, SMCA, EDTA SOLU
- AMINO SILICONE & DEFOAMER

ALL KIND OF TEXTILE AUXILIARIES & CHEMICALS

BALAJI POLYMERS

Authorised Stockists & Dealer :–
B–1, Milind Park,
Opp. St. Xavier's High School
Bus Stop, Memnagar Road,
AHMEDABAD – 380 052 INDIA

Ph. 402105 / 440694 / 490084
TLX : 121 6196 MPC IN
GRAM : POLYNOL

For your direct import from our foreign suppliers of various industrial chemicals, intermediates, fine chemicals, pharmaceuticals etc including following items

(ASC) N-Acetyl Sulphanilyl Chloride (Japan)

(Important High quality Intermediate for Sulpha Drugs & Vinyl Sulphone. Also to avoid use of Chlorosulphonic Acid and pollution problem)

Isobutyl Benzene
Bisphenol-A (Japan)
Iodine Crude (Japan)
Caustic Potash
DL-Methionine Feed Grade
2 Chloro Propionic Acid
Isophorone
2,6 Dichloro Aniline
Dimethyl Formamide
Furfuryl Alcohol
Tween 80
Morpholine
Isopropylamine
Triethylamine
Glyoxal 40%
Sodium Metal
2-Ethyl Hexanoic Acid
Beta Picoline
N,N Dimethyl Aniline
Dicyanodiamide
Naphthalene Crude
Epichlorohydrin
Pyridine Pure 2°C
Diethyl Sulphate
L-Lysine Feed Grade

Acrylamide
Propylene Glycol
Propionic Anhydride
Dimethyl Carbonate
Cyclohexanone
MPD, MTD
Phenol USP
Diphenylamine
Trimethylol Propane
Cyclohexylamine
Choline Chloride 50%
Thioglycolic Acid
Gamma Picoline
Perchloroethylene
Benzaldehyde FFC
Sodium Metal
Para Nitro Aniline
Para Chloro Aniline
Ammonium Persulphate
Ortho Nitro Aniline
Ortho Chloro Aniline
Trichloroethylene
Parachloro Benzoic Acid
DM50

and other Industrial chemicals/intermediates/fine chemicals etc.

Please Contact the Indenting Agent:

PACIFIC

M/s. PACIFIC AGENCIES

41, Prospect Chambers Annexe, 3rd Floor, 317, Dr. D.N. Road, Bombay 400 001
Telephone: Office: 2044482/244923/232833
Residence: Mr. Lathi 5113387 Mr. Vyas 5121909
Telex: 011-6799 PCFC IN

AVAILABLE

* STEARIC ACID (All Grades)
* RICE BRAN DISTILLED FATTY ACID
* GLYCERINE (I.W.)

For Quality, Competitive Prices & Regular Supplies

Contact:

FOODS FATS & FERTILISERS LTD.

G.P.O. Box No. 10066, Green House, Green Street, Fort, Bombay 400 023
Tele: 2862136/2861846

25 Glorious Years!

For Your Regular Requirements Of:

ZINC ASH — (SUITABLE FOR MFG. ZINC SULPHATE)
ZINC HYDROXIDE — (OFF COLOUR)
ZINC DUST
BRASS ASH — (SUITABLE FOR MFG. (COPPER SULPHATE ETC.)
ZINC OXIDE
COPPER OXIDE/ASH

Please Contact:

METAL TRADING CORPORATION

Dadbhawala Sadan, 384'9, Telang Cross Road,
Opp. Syndicate Bank, Matunga, Bombay-400 019.
Phone: (Off.) 4373708, 4374206; (Resi.) 6124047, 6151621
Gram: 'HIMETCHEM', Matunga, Bombay-400 019.

For Your Regular Requirements of:

Acetonitrile
Acetyl chloride
Acrylamide * Acrylonitrile
Allyl Alcohol
Alpha Picoline
Butyl Cellosolve * B.H.T.
Chloroform * Cyclohexane
Di Methyl Formamide
Di Methyl Sulphoxide
Epichloro Hydrine
Ethylene Dichloride
Formic Acid -- 99% & 85%
Hydroxylamine Hydrochloride
Hydroxylamine Sulphate
Iso Amyl Alcohol
Iso Butyl Alcohol
Iso Butyric Acid
Iso Propyl Alcohol
Lithium Hydroxide
Magnesium Oxide
Malonic Acid
Methyl Cellulose 4000
Methyl Cellosolve
Methyl Formate
Morpholine
Methyl Ethyl Ketone
N. Butyl Amine * N. Butyric Acid
N. Heptane * N. Propyl Amine
Quinoline * P.C.B.A.
Para formaldehyde 84-85%
Perchloro Ethylene
Petroleum Ether 40-60%, 60-80%, 60-95%
Secondary Butanol
Sodium Methoxide
Soya Lecithin Powder
Thiourea
Tri-Chloro Ethylene, T.E.G.
Tertiary Butyl Alcohol
Xanthone * Zinc dust

H.P.M.C. 5 CPS, 15CPS, 50CPS, 606 CPS

Please Contact: Gurukrupa Chemical Corporation

Gopal House, 2nd Floor, 7/9, Kumbharwada Cross Lane, Veer Vithaldas Chandan Street, BOMBAY 400 003.
Phones: 321020/339968/344937
Residence: 6124644/6122149

PARACETAMOL

IP/BP

CHEMICAL Formula

Acetaminophen
4' – Hydroxyacetanilide
P – acetylaminophenol
N – Acetyl p-aminophenol
P – acetaminophenol
P – acetamidophenol

STRUCTURAL Formula

MANUFACTURAL Formula

farmson

THE PERFECT PRODUCT OF

farmson
Pharmaceutical Gujarat Pvt. Ltd.

Head Office: Shankar Bhuvan, Sayaji Gunj, Vadodara-390 005. Phones: 327136/327138. Grams: FARMSON. Telex: 0175-694 KEKE IN

Works: 98/1-2-3-4, GIDC Industrial Estate, Nandesari, Dist. Vadodara. Phone: 219.

Research Centre: At Nurpura, Post Baska, Tal. Halol, Dist. PANCHMAHALS

SALES OFFICES:

Bombay: 404, Embassy Centre, Nariman Point, Bombay 400 021. Phones: 231144, 230383. Gram: KEKEVII

Hyderabad: 1-1-700/B-1, New Bakaram, Hyderabad-500 380. Phone: 65836. Gram: FARMSON.

Regional Representatives

- KHOKANI ASSOCIATES, 3rd Floor, Keshav Baug, 116, Princess Street, BOMBAY-400 002. Tele. No. 252244, 252888
- PAN ASIAN Commercial Corporation, 4, Rabindra Sarani, CALCUTTA-700 001. Tele No. 277595-475047. Cable: PANASIAN
- B & I Enterprise, Cama Building, 2nd Floor, 24-26, Dalal Street, BOMBAY-400 023. Tele No. 271964
- NEELGIRI AGENCY, B-5, Shivdut House, Karampura Comm. Centre, Opp. Milan Cinema, Najafgarh Road, NEW DELHI-110 015. Tele. No. 5413818

NIRMAL

The Biggest Manufacturer of India

For Quality And Quantity

Mono Chloro Benzene (M.C.B.)
Para Di Chloro Benzene (P.D.C.B.)
Ortho Di Chloro Benzene (O.D.C.B.)
Tri Chloro Benzene (T.C.B.)

Contact Manufacturers:

CHEMIEORGANIC

G-6, Everest, Tardeo, Bombay 400 034.
Phones: 4949468/494195. Gram: SYNTHORGAN, Bombay-34. Telex: 011-76297 BABA IN

We are exclusive dealer of

M/s. DYNAMIT PHENOTEX (P) LTD.

Manufacturer of

Sodium Pentachlorophenate (Phenton - N)
Pentachloro Phenol (Phenton - P)
Trichloro Phenol
Monochloro Phenol

All Products confirm to their respective I.S. Specifications
For any Inquiry please contact:

MAHESH BROTHERS

165, Samuel Street, 2nd Floor, Vadgadi, Bombay 400 009.
Phones: Off.: 8551609, 8551672 Resi.: 5611417 (Board): 8551531, 8554299, 8553572

We Offer A Best Quality at a Very Competitive Rates
For your Small & Bulk Requirements Of:

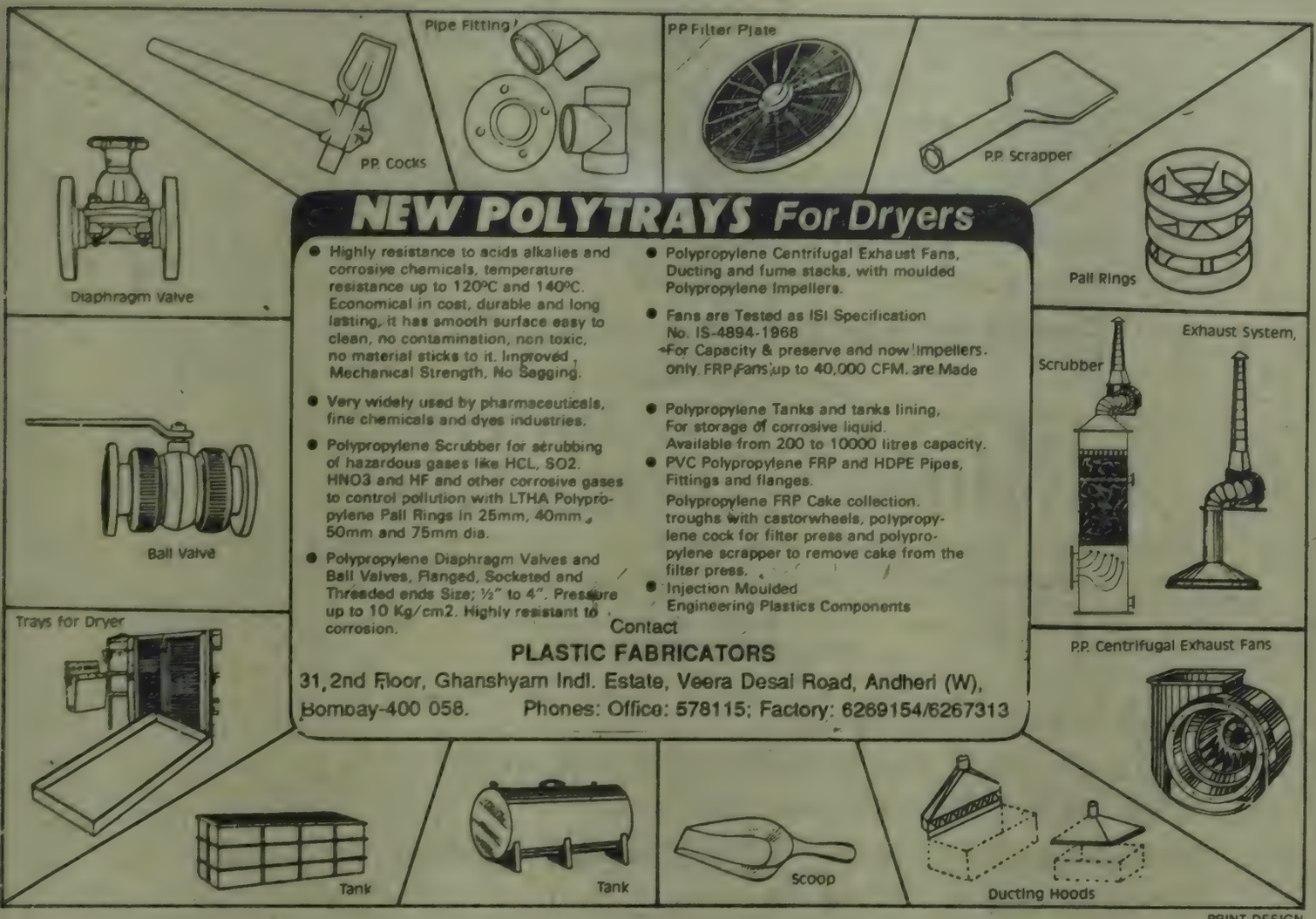
Phosphorous Tri Chloride (PCl_3)
Phosphorous Oxy Chloride ($POCl_3$)
Phosphorous Pentoxide (P_2O_5)
Tri Ethyl Phosphate (TEP)
Tri Chloro Molybdenum Phosphide (TCMP)

Please Contact Manufacturers:

SANDHYA DYES & CHEMICALS

Regd. Office & Works
Plot No. 1703, G.I.D.C. Sarigam,
Sarigam 396 155, Bulsar, Gujarat.
Phone: 149 (Bhilad Exchange)

Bombay Sales Office
5/7, Modern Villa Building
7th Road, Santacruz (East), Bombay 400 055
Phone: 6146516



NEW POLYTRAYS For Dryers

- Highly resistance to acids alkalies and corrosive chemicals, temperature resistance up to 120°C and 140°C. Economical in cost, durable and long lasting, it has smooth surface easy to clean, no contamination, non toxic, no material sticks to it. Improved Mechanical Strength, No Sagging.
- Very widely used by pharmaceuticals, fine chemicals and dyes industries.
- Polypropylene Scrubber for scrubbing of hazardous gases like HCL, SO2. HNO3 and HF and other corrosive gases to control pollution with LTHA Polypropylene Pall Rings in 25mm, 40mm, 50mm and 75mm dia.
- Polypropylene Diaphragm Valves and Ball Valves, Flanged, Socketed and Threaded ends Size; ½" to 4". Pressure up to 10 Kg/cm2. Highly resistant to corrosion.
- Polypropylene Centrifugal Exhaust Fans, Ducting and fume stacks, with moulded Polypropylene Impellers.
- Fans are Tested as ISI Specification No. IS-4894-1968
- For Capacity & preserve and now Impellers only FRP Fans up to 40,000 CFM. are Made
- Polypropylene Tanks and tanks lining, For storage of corrosive liquid. Available from 200 to 10000 litres capacity.
- PVC Polypropylene FRP and HDPE Pipes, Fittings and flanges.
- Polypropylene FRP Cake collection. troughs with castorwheels, polypropylene cock for filter press and polypropylene scrapper to remove cake from the filter press.
- Injection Moulded Engineering Plastics Components

Contact

PLASTIC FABRICATORS

31, 2nd Floor, Ghanshyam Indl. Estate, Veera Desai Road, Andheri (W), Bombay-400 058. Phones: Office: 578115; Factory: 6269154/6267313

PRINT-DESIGN

GOOD NEWS!!!!

Your Search for a GENUINE, RELIABLE and COMPETITIVE SUPPLIER of Imported Pharmaceutical, Cosmetic Auxiliaries with MODVAT benefit ends here

1. KOLLIDONE/PLASDONE U.S.P. (Polyvinyl Pyrrolidone -- BASF Pharmaceutical Grade)
2. HYDROXY PROPYL METHYL CELLULOSE (Methocel E-5, E-15, E-50) Pharmacoat 603, 606, 615.
3. ETHYL CELLULOSE Dow/Hercules (N-7, 10, 20/22, 50, 200)
4. VEEGUM N.F. (U.S.P.) Pharma Grade
5. CARBOPOL 934, 940 (BF GOODRICH)
6. HYDROXY ETHYL CELLULOSE (Natrosol 250 LR/GR)
7. METHYL CELLULOSE (400, 4000 CPS)
8. TERTIARY BUTYL HYDRO-QUINONE (T.B.H.Q.) Eastman Kodak, U.S.A.
9. LACTIC ACID 88-92% U.S.P.
10. TETRA HYDROFURAN
11. VANILLIN/ETHYL VANILLIN USP
12. HYDROXYLAMINE HYDRO-CHLORIDE
13. PROPYLENE GLYCOL U.S.P. (DOW/JAPAN)
14. ADIPIC ACID

Kindly Contact us for your specific requirements

Mr. ZUBIN ZAVERI / Mr. ANIL ZAVERI

TRANS-CHEM CORPORATION

208-209, Adamji Bldg., 413, Narsi Natha Street, Bombay 400 009.
Tel.: 334290/336404/345910; Resi: 5126843. Telex: 011-75197 STCO IN

Delhi Office: SANTOSHEEL DISTRIBUTORS
CM-2, Ansals Dilkush Industrial Estate, G.T. Karnal Road, Delhi 110 033. Tel.: 7223410/2523265

WE BELIEVE IN QUALITY OF QUANTITY

ATTENTION CONSUMERS AND EXPORTERS
AVAILABLE QUALITY PRODUCTS

2:5 Di Chloro Aniline (Scarlet GG Base)
2:5 Di Chloro Nitro Benzene
Ortho Chloro Aniline
Para Nitro Phenol
Sodium Para Nitro Phenol

Contact Manufacturers:

GEMCHEM INDUSTRIES
MEDICS LABORATORIES

74, Matru Smruti, Road No. 4, Scheme No. 6, Sion (East), Bombay 400 022.
Phones: 4077431/32/33 * Telex No.: 011-73254 ALAB IN

SPECIALITY CHEMICALS

* **Ethylene Oxide Condensate**
* **Propylene Oxide Condensates And Co-polymers**
* **SLES, TEALS, Cocodiethanolamide**
* **Synthetic Lubricants for high temperature service**
* **Industrial Liquid Detergents**
* **Tailor-made Spin Finish Oils and Coning Oils for Synthetic Fibre/Yarn**
* **Speciality Chemicals tailor-made to Customer's requirements**

UNITED PESTICHEM & NONIONICS PVT. LTD.

"AHURA", 84 Sion Road, Sion East, Bombay 400 022.
Phone Nos.: 4074295/96; 4073355; 4091752

AVAILABLE BEST QUALITY WITH EXCISE MODVAT FACILITIES

LACTIC ACID (SPAIN)
SODIUM LACTATE SOLN. 60% & 70% w/w

SODIUM CITRATE I.P.
DISODIUM HYDROGEN CITRATE B.P.
POTASSIUM CITRATE I.P.
SODIUM ACID PHOSPHATE I.P.
SODIUM CITRATE ANHYDROUS
NICKEL SULPHATE
NICKEL NITRATE
DIPOTASSIUM HYDROGEN CITRATE
CITRIC ACID ANHYDROUS
TRICHOLINE CITRATE SOLN. 65% w/w
IRON CHOLINE CITRATE SOLN. 66% w/w
CHOLINE DIHYDROGEN CITRATE SOLN. 50% w/w
COBALT SULPHATE
AMMONIUM MOLYBDATE

Manufactured by:

M/s. SUNIL CHEMICALS

ADMN. OFFICE:
63, Shamaldas Gandhi Marg,
Devkaran Mansion,
1st Floor, Bombay 400 002.

FACTORY
Parekh Industrial Estate,
Chandansar Road, Vihar (East),
Dist. Thane (M.S.)

Phones: (Bombay) 2864003, 2864086, 2864226. Residence: 6230699

VINOSHA

FOR YOUR REQUIREMENT OF EFFICIENT HEATING AND DRYING EQUIPMENTS LIKE:-

- ☐ FULLY AUTOMATIC OIL FIRED NON-IBR BOILERS UPTO 500 KGS/HOUR.
- ☐ OIL FIRED THERMIC FLUID HEATING SYSTEMS IN ALL CAPACITIES.
- ☐ COAL/WOOD/HUSK FIRED THERMIC FLUID HEATING SYSTEMS.
- ☐ OIL FIRED TRAY DRIERS FOR 200 TO 1200 TRAYS.
- ☐ INDUSTRIAL DRYING OVENS IN ALL CAPACITIES HEATED BY ELECTRICITY/STEAM/THERMIC FLUID.
- ☐ FLUID BED DRIERS.
- ☐ HOT WATER GENERATORS.
- ☐ WASTE HEAT RECOVERY SYSTEMS.
- ☐ ROTOCONE VACCUM DRIER.

M/s. VINOSHA BOILERS PVT. LTD.

204 CHANDAN CHAMBERS, 138, MODI STREET, FORT MARKET, BOMBAY - 400 001.
TELEPHONE: 2611515/2612061 GRAMS: 'VINOSHA' TELEX: 011-76004 SAIR IN

FOR YOUR REQUIREMENTS OF

* PARA TOLUENE SULPHONYL CHLORIDE
* PARA TOLUENE SULPHONAMIDE
* PARA TOLUENE SULPHONYL UREA
* PARA TOLUENE SULPHONIC ACID
* PARA CHLOROBENZENE SULPHONAMIDE
* PARA CHLOROBENZENE SULPHONYL UREA
* RANSOLITE (SULPHONAMIDE RESIN)

Please Contact:

MANUFACTURER:
M/s. USHMA INDUSTRIES
124/36A, G.I.D.C.
Nandesari 391 340, Dist. Baroda,
Gujarat State
Phones: 320761, 320645
Resi: 21396, 22194.
Fax: 0265-320929. Telex: 0175-401 HEMA IN.

BOMBAY DEALER:
PARUL TRADING CO.
Room No. 10, 1st Floor,
310-314, Samuel Street,
Bombay - 400 003.
Phones: 337738, 327105
Office Time: 1.00 p.m. to 6.00 p.m.

CALCUTTA OFFICE:
MR. GAUTAM B. PATEL,
RECKON REMEDIES
28/3A, Convent Road, 4th Floor, Calcutta 700 014. Phone: 249587; Resi: 469164

From the Country's Largest Plant

GNFC ASSURES
Availability of Nitric Acid
On Continuous Basis

Concentrated Nitric Acid (98.5%)
Weak Nitric Acid (60%)

From its latest diversification - the Nitrophosphate complex with internationally renowned technology - GNFC now offers Nitric Acid in bulk quantity.

A Boon to the Industry !

For your requirement kindly get in touch with
Senior Marketing Manager
Industrial Products

Gujarat Narmada Valley Fertilizers Company Limited

P.O. Narmadanagar - 392 015 District - Bharuch (Gujarat)
Phone : 02642-32001/32424 Telex : 01813-201/202, 0175-390/399 Gram : GNFC-BHARUCH

Chemical Weekly

VOL. XXXV MAY 15, 1990 NO. 36

Publishers:
SEVAK PUBLICATIONS

Editor - Publisher
R. RAGHAVAN

Advertisement Manager
N.R. RAJAGOPALAN

Administration/Circulation
VIJAY RAGHAVAN

Editorial & Administrative Office:
306, Shri Hanuman Industrial Estate
G.D. Ambekar Road, Wadala,
BOMBAY 400 031.
Phones: 4120743/4131198.
Telex: 011-76053 CWLY IN

Madras Office:
Room No. 9, Wellingdon Estate,
3rd Floor, 24, Commander-in-Chief
Road, Madras 600 105.
Phone: C/o. 471659.
Telex: 041-6290 CWLY IN.

Printed at:
Sevak Publications,
25, North Mada St., Thiruvanmiyur,
Madras 600 041.

Fast Print Service,
307/308, Shri Hanuman Indl. Estate,
G.D. Ambekar Road, Wadala,
Bombay 400 031.

Subscription Rates:
(Inclusive of Postage)
India: Rs. 400.00
Foreign: US$ 175.00 (Air Mail)
US$ 75.00 (Sea Mail)

Subscription charges payable in advance in favour of SEVAK PUBLICATIONS

CONTENTS

Heralding the 21st Century: Can coal stage a comback on the global energy scene? Emerging trends in international coal trade— T.P.S. RAJAN 41
Chemarena — S.L. VENKITESWARAN 43

IN THE NEWS
New industrial policy in the current session of the Lok Sabha 46
PIB approval soon for TN aromatics project 48
India Glycol resumes MEG production 53
ICI seeks buyers for Thane unit 54

PHARMACEUTICAL CAPSULE
Antibiotics, vitamin A tablets prices up 49
Drug price controls may be eased further 56
Seminar on technology upgradation in drug industry 57

ON THE ECONOMIC FRONT
Investment limit of small units with good export record up 61
Blanket advance licensing scheme: Ministry notifies norms 62

FERTILISER BRIEFINGS
Delay in takeover of MCF by RCF: Karnataka government asked to consider proposals made by private firms 64
Two more items under FCO 66

OIL AND NATURAL GAS SCENARIO
Ban order ignored: Officers stir paralyses work in oil industry 69
Pipeline projects: IOC to go ahead 70
Crude oil import put at 19.54 MT 71
Petrofils supports Nirlon modernisation plan 72
OPEC accord on output cut 72
ONGC efforts towards energy conservation 73
Panna field project dragging on 76
Petroleum coke to be imported 77

ENVIRONMENT NEWS
Effluents disposal: Show cause notice to 22 firms 50
UK minister discusses major environmental projects 78
Industries poison Ahmedabad 80
Waste water treatment: UASB technology viable 81
Abuse of power by UCC even before Bhopal mishap 82
Pollution control: Flakt India to expand field 83

ENERGY SCENARIO
Energy efficiency projects: UK to provide £50m 84
Tapping non-conventional energy sources 86
Enforcing energy conservation 87

SPECIAL ARTICLE
Remote Sensing and Petroleum Seepage in Exploration — Dr. R.H. CLARKE 105

REGULAR FEATURES
Highlights in Chemical Technology 91
Materials Management — Part XIII — Value Analysis — N.R. PAI 97
Science Briefs 102

INTERNATIONAL SPECTRUM
News about New Projects 113
Environment 118
Biotechnology 121

MARKET INFORMATION
Bombay Chemicals Market 123
Bombay Dyes Market 128
Bombay Drugs Market 131
Madras Market 132
Shipping News 133
Materials Imported 137

NAPHTHALENE
ACENAPHTHENE
ACETOPHENONE
CARBAZOLE
PURE PYRIDINE AND BASES
INDOLE
XYLENOL
COUMARONE INDENE RESINS
PETROLEUM RESINS
EXTENDERS FOR EPOXIDES AND POLYURETHANES

CHIKA

CHIKA LIMITED

Bhubati Chambers, 13, Mathew Road, Bombay 400 004.
Phones: 8113456/1457 Cable: "DYECOLD" Telex: 11 75562 and 11 75534
Branches
AHMEDABAD: Ashram Road, CALCUTTA: 36, Ganesh Chandra Avenue
MADRAS: 122, Mount Road, NEW DELHI: 25/1, Asaf Ali Road

CHEMICAL WEEKLY

VOL. XXXV MAY 15, 1990 NO. 36

HERALDING THE 21st CENTURY - 51

Can Coal Stage a comeback on the global energy scene? Emerging trends in International Coal Trade

NOT LONG AGO it was widely forecast that the days of the coal industry, or "OLD KING COAL" as it was referred to, were numbered. By the 1950s it was being squeezed out of its biggest markets by its expanding competitor, oil. The new fuel was cheaper and was seen as being more convenient and cheaper to use. At that time oil also lacked with a notoriously militant labour force. Nuclear power also entered the electricity sector and natural gas began to invade the heating markets.

During the 1960s some of the world's major coal industries went into a rapid downward slide. Between 1961 and 1971, some 400 collieries were closed in Britain with 300,000 miners finding alternative employment. In the developed countries the decline of coal was regarded as irreversible.

Then came the dramas and traumas of the 1970s and the oil-price explosions which rocked the world. The oil crisis of 1972 and the subsequent actions of OPEC had three major effects on the world energy scene:

* Supplies of oil and gas were allowed to follow the laws of supply and demand -- quantities released to the world market were arbitrarily controlled by OPEC countries.
* The prices of oil and gas were suddenly increased by three and four-fold or five or ten fold to impose great financial strains on the worlds economics.
* The continued flow of oil supplies could no longer be guaranteed -- free of political or nationalistic interference.

This situation forced the industrialised nations of the world to turn to other major sources of energy. With the tremendous upsurge of interest in coal as the "Fuel of the Future", there was a proliferation of conferences, seminars, multi-client studies, long term forecasts, etc., during the last decade. Billions of pounds were poured into new mining ventures, often by international oil companies, dismayed by the sudden loss of their lucrative power station fuel oil sales.

Further, major investment also took place in port facilities, railways and other infrastructure as a large expansion was expected in the volume of coal traded internationally, both overland and seaborne.

In the period since 1973 the coal industries have experienced some setbacks as well as successes. The forecasts used for many of the new mining investments often proved to be widely optimistic. They failed to predict the depth and duration of the economic recession which followed the second oil shock of 1979 and its depressing effect on electricity and energy demand.

The major steam coal estimates published at the end of the 1970s forecast that total world steam coal demand would increase at 3.0 to 3.5 per cent per annum from the base year (1977) of 2.2 billion tonnes to 3.3 billion by 1990 and 4.4 billion by the year 2000. Global steam coal demand actually increased to 2.9 million tonnes by 1987 and it is now thought unlikely that demand will exceed 3750 million tonnes by 2000.

An analysis of the international coal trade for the eighties shows that nearly 25% of coking coal and 5% of non-coking coal requirements are met by the transport of coal involving a movement of about 270 million tonnes forming nearly 10% of the annual world consumption in the decade.

During the period 1978 to 1982, total coal demand increased by some 280 million tonnes, an increase of over 9.6% or 1.93%/annum. However, most of the increase took place in the first two years, namely 1979 and 1980. The figures also show that while steam coal demand increased, coking coal demand fell back.

In the second half of the 1980s coal producers were knocked by plummeting oil prices. Many new mines were unable to repay the cost of their capital charges and increasingly, coal producers have found themselves competing with each other. More recently, the industry has been aware of growing public and political sensitivity about the effect of fossil-fuel burning on the planet and the atmosphere.

It was recently observed, however, that the momentum created in the 1970s is still strong. This is shown by the scale of new investments, their widespread distribution, the sharpening competition between producers (old and new) the drive for more efficient mining methods and technologies, as well as advances in ways of transporting and burning coal.

Coal trade -- key issues. When considering international trade in coal, it is important to remember a number of salient facts:

* Internationally traded coal comprises only 10% of total world demand.
* International trade in coking coal shows a quite different pattern to that of steam coal.
* International trade itself is split into two categories: overland and seaborne. Over the five year period total demand increased by some 470 million tonnes, an increase of 15.8% overall or 3.6%/annum. This overall increase was almost twice that of the rate of increase (1.85%/annum) reflected for the period 1978 to 1983.

Within the total picture, coking coal rose from its 'low' of 495 million tonnes in 1983 -- the first time it had fallen below 1960s -- by 4% in 1984 but then levelled out and rose only a further 4% in the next three years. It is interesting to note that of the total demand some 90-91% was supplied

by local (indigenous) production and that only 9 to 10% was met by international trade. Furthermore within the 9 to 10% share held by international trade, a fair proportion is concentrated by overland movements. The overland trade percentage share continues to decline as West German exports of coking coal to European countries are replaced by Australian and US coking coal even as the absolute tonnage of international trade increases, all in the shape of seaborne movement.

Seaborne trade now accounts for some 82% of international trade and within that 82% share there has been a marked swing between coking and steam coal in the last two decades. In the early 1970s coking coal movements constituted some 75% of all sea-borne movements but this share has fallen steadily until it is now 55%.

Seaborne traded coal is transported in large bulk carriers, which are typically 40,000 dead weight tonnes (dwt). Larger carriers used in the trade are the Panamax-sized vessels of 50-70,000 dwt and Cape-sized vessels of 110-130,000 dwt. The largest ever coal cargo was 200,000 dwt.

International Trade Patterns. *Coking Coal.* The international trade patterns for coking coal can be highlighted as under:

In the period 1978 to 1982 only some 22-28% of total coking coal demand was met by international trade. In the period now under review this percentage has increased to 31.8%.

There are two factors which help to explain this development:

a) The decline in production in the well established steel communities in the EC which has led to increased imports to meet demand.
b) The main growth areas have been the Pacific Rim countries which have no significant local production.

The main exporting countries during the five-year peiod are Czechoslovakia, West Germany, Poland, USSR and USA for overland trade. The main exporters by sea are Australia, Canada, China, West Germany, Poland, South Africa, USSR and USA.

Of the total volume of international movements, the proportion supplied by overland trade has continued to decline over the years until it is now only some 13-14% of the total. The reasons for this are threefold:

a) The inability of West German production to compete with Australian and US coal in terms of cost in the European market.
b) The static nature of the captive market, in Eastern Europe supplied by Poland and USSR.
c) The fact that the burgeoning markets for coking are those markets such as Japan, South Korea, Brazil and Turkey that rely on imports for their additional requirements.

Seaborne trade during the period 1983 to 1987 was dominated by Australia and the USA. Between them they have supplied some two-thirds of the coking coal moved by sea with Canada contributing some 12% and Poland a further 6%.

The import scene during this period was again dominated by Japan with approximately 40% of the total seaborne movements. Brazil, Italy and South Korea took some 5%.

Steam coal. The main overland movements are:

* USA supplies to Canada
* Poland supplies to USSR/other Comecon.
* USSR supplies to other East European Countries.
* West Germany supplies to other EC

In 1983/84 these movements accounted for 30% of the export trade but this share fell to 25% thereafter. For hard coal in general many questions remain to be answered -- the environment, pollution, oil and gas prices, changing technologies, even new fuels (orimulsion).

Looking ahead to 2000, a number of decisions have to be made: (1) Is world economic growth going to continue, will it stagnate or will it go into decline? It is assumed that over the 10 year period, growth will increase at a rate of 1.5 to 2.0%/annum, although within that modest progression there will be peaks and troughs.

International Trade Patterns -- Forecast for the coming decades. *Coking coal.* It seams fairly certain that the international trade patterns will, for the next ten years, follow much the same lines as in recent years with overland trade remaining static in absolute terms but constituting a smaller percentage of total movements. Seaborne trade is likely to grow at a healthy rate, particularly to meet demand in the Pacific Rim and Western Europe.

Australia, because of its geographical and special commercial links, will continue to supply the largest share of the Pacific Rim imports, hoping to increase its share of the spoils, but will probably have to battle to hold its own in Europe if the current hardening of freight rates continues in the long term. Canada with its contractual links in the same area will aim to maintain its outlets, but will find it hard to increase its exports if prices become very competitive.

USA, being the marginal supplier, will no doubt fluctuate with market conditions, but always maintain a solid and substantial movement to all areas. Poland and the USSR are likely to continue at much their present levels of export, acting as residual suppliers in the overall international supply pattern.

Steam Coal. In recent years there has been a more realistic approach to forecasting future levels of steam coal demand. In particular it is now accepted that in the commercial light industry and domestic heating sector, coal will make no significant inroads into this market, of which oil and gas now have a significant share. It is also accepted that coal-to-oil conversion projects on which so much hope was pinned, and money spent, in the early 1980s, are not an economically viable alternative in the near future.

The common view is that the forecasting of future coal demand should be based on the potential growth of electricity (power stations) and heavy industry (cement) and within these terms the likely share that coal will obtain of that energy growth.

In the steam coal sector a number of basic assumptions can be put forward:

* There will be two major importing areas: Pacific Rim and Western Europe.
* There will be three major and established supply sources: Australia, South Africa and USA.
* There will be three challenging and recent supply sources: China, Colombia and Venezuela.
* There will be three established but static or declining sources of supply: West Germany, Poland, USSR.
* The current economic and commercial concept governing consumer buying and producer selling will continue to prevail, namely:

1. No one area will wish to depend too heavily on any other area, either as a supplier or for its supply.
2. Producers will seek to diversify their contracts for security reasons. Continuity of offtake is an essential constituent of their cash flow success
3. For a variety of reasons the USA will continue to be regarded as the marginal supplier.

— T.P.S. RAJAN

CHEMARENA

S.L. VENKITESWARAN

Chiral Synthesis

An important development on asymetric synthesis of optically active compounds is reported by chemists of University of Illinois. It is similar to the catalytic asymetric expoxidation of allylic alcohols and catalytic asymetric dehydroxylation of unsubstituted olefins earlier reported by chemists of M.I.T. The new reaction uses as catalysts some chelates of manganese III with imines of (R,R) or (S,S) 1,2 diamine diphenyl methane and substituted salicylaldehydes and creates two dissymetric carbon atoms in one shot. It is catalytic in that requirement of the reagent is in catalytic quantities and not stoichiometric.

The catalytic asymetric expoxidation works better with cis than with trans olefins. Trans beta diethyl styrene gave 93% yield but only 20% enantiometric excess as compared to 73% yield with 84% enantiometric excess with cis methyl styrene. The reaction works best with unsubstituted olefins. A phase transfer reaction with 1 to 8 mol% epoxidation catalyst and 5% sodium hypochlorite solution with methylene chloride as organic phase. Hypochlorite is cheaper and is said to give more moles of product per mole of catalyst. The diamine to make the catalyst is based on reaction of benzil, cyclohexanone and ammonium acetate to get 1,4-diazospiro [4,5]deca 1,3 diene.This is reduced with lithium to an imidazolidine which is hydrolysed to a racemic 1,2 diphenyl diamino ethane. Fractional crystallisation of the tartarate salts resolved the diamines to over 99% optically pure isomers.

The practical applications of this novel asymetric catalyst system would be watched with interest. (Ref. *C&EN*, 2.4.90).

While the new epoxidation process is claimed as one way to desired optical isomers, there is no doubt that chiral chemistry holds the key to the progress in pharmaceuticals and could revolutionise the processes. Of some 1,800 drug intermediates available 57% have at least one chiral centre. But many are sold in the racemic mixture form. Only 58 are said to be sold as the single desired isomer and necessarily command higher prices. Separation is a question of costs which could be linked to the way the unwanted isomer is processed or recycled. Drug activity is limited generally to one isomer and the other may be a ballast or in rare cases such as happened with thalidomide, downright dangerous. Increased supplies of chiral intermediates or chiral pathways will surely stimulate the industry to greater efforts.

An instance of replacing earlier racemates by the desired isomer is of Schering's Labetalol -- a beta blocker now replaced by the d-isomer under the name Dilevalol. Use of enzymatic processes may help in better methods to chiral compounds. Many of the top firms such as ICI, DSM, Lonza, Calgene, Kaneka are specialising in this area. Lonza who is not in the drug market offers a variety of chiral intermediates for the producers of drugs -- some of them linked to their top position in ketene chemistry -- citro-maleic acid, dimalic acid, R glycidyl butyrate etc. There are innovations in racemate separation -- enzymatic processes based on kinetic resolution and preparative chiral hplc etc. Biotechnology can provide biocatalysts which are sterospecific. Nonenzymatic asymetric oxidation using a catalyst system may prove more attractive and Arco is reportedly venturing for commercial operation in this area. International biosynthesis is making S and R isopropylidene glycerol (IPG) required as intermediate for beta blockers. A whole range of new derivatives of LPG are planned. Japan's Kaneka claims to have the best way to d-p-hydroxyphenyl glycine -- DHPG -- for amoxycillin. It is said to be based on an immobilised enzyme. A new era is taking shape in drug chemistry.

Biomass burning

The practice of burning large volumes of waste biomass on land and forest is quite extensively practised in many parts of the world. The forest fires also add to the quantities of biomass that end up as carbon dioxide. Large tracts of rain forests are also burnt off for clearing the land for regular agriculture or other uses. It is now being realised that the damage to the environment and stratosphere can be far more than from the carbon dioxide released by burning of fossil fuels. This was revealed at a conference sponsored by the American Geophysical Union and the NASA (National Aeronautics and Space Administration) of USA. Biomass burning creates several "greenhouse" gases and also chemically active components which can cause acid rain and tropospheric ozone depletion. It is estimated that 5% of the earth's land surface gets burnt every year with such vegetation or wastes that are on it.

The estimate of biomass burning which contribute the C, N and O to the atmosphere and proposition of this to the total is revealed in Table below (as per Max Planck Institute of Chemists):

Million Metric tons per year as C, N or O	All Combustion sources	% from biomass
Carbon dioxide gross	8700	40
Carbon dioxide net after quantity taken up by vegetation	7000	26
Carbon monoxide	1100	32
Methane	380	10
Non-methane hydrocarbons	100	24
Ozone	1100	38
Ammonia	44	12
Nitrogen Oxide (NOx)	40	21
Nitrous oxide	13	6

3 to 5 billion tonnes of biomass carbon get burnt as compared with 5 to 7 billion tonnes of fossil carbon. The latter at least provides energy while there is hardly any return from biomass burning. Burning of Savannah forests in Africa is said to account for a third. It is also revealed from photographs taken by astronauts that large areas over Amazon river valley is under heavy smoke -- perhaps a few million square kilometers. The nitrogen oxides and carbon monoxide contributed to formation of ozone in troposphere. Acid rain could arise from formic and acetic acid. Soil nutrient balance may be upset by the burning.

How far climate can be affected is at present a matter of speculation but it has to be admitted that deforessed land can retain far less rain water. Ozone levels over parts of Amazon basin and Africa are as high as even industrial countries.

Indian farmers also have a regular practice of burning off plant residues after harvesting besides of course the extensive deforestion by burning in tribal areas. It is time that we woke up to this serious problem and assess the potential impact and means to avoid the nemesis at a not too distant date.

Methane directly to Synthetic Gas?

The wide range of Research on methane activation is likely to lead to a process for direct conversion of methane to synthesis gas. Researchers at Oxford University have a new series of ruthenium based catalysts that provide high activity and selectivity for this conversion. Catalysts of the type of $Ln_2Ru_2O_7$ (where Ln is a lanthanide) are extraordinarily active in partial oxidation of methane at lower temperature. The catalysts are ruthenium analogues of a number of rare earth/tin oxides that have been used for oxidative coupling of methane to ethylene (another gateway to petrochemicals).

Partial oxidation of methane

$$CH_4 + 1/2\ O_2 \longrightarrow CO + 2H_2$$

is mildly exothermic and produces synthesis gas of unusually low H/CO ratio and this may be advantageous. Gas Research Institute of Chicago, USA has funded the Oxford study. Activation of the C-H bond holds a key to newer sources for petrochemicals and a new wave of catalysts are emerging. The ruthenium catalyst has of course higher activity at higher temperatures but carbon monoxide rather than the dioxide is dominant at above 693°C. With nitrogen diluents, methane conversion exceeds 90% and selectivity 94% with these mixed oxides. The reaction mechanism is not yet clear but a carboneous surface may be involved.

The work is pregnant with promise for the C1 chemistry.

Canada's big plans for MTBE

MTBE as octane booster is one of the highest growth rate chemicals of today and naturally Canada with its plentiful natural gas resources is planning in a big way for entry into MTBE. The new Canada/US Free Trade Agreement provides a ready market across the border with USA, the largest gasoline consumer and leader in the legislation for phase-down of TEL. Three plants of 500,000 tonnes a year are expected in the next 2 years as detailed below:

1. Petro-Canada, Neste OY -- Edmunton -- 500,000 tpa.
2. Soquip, ENI -- Montreal -- 500,000 tpa.
3. Noverco, Nova Petro -- Sarnia -- 500,000 tpa.

Two of the projects have as partners the largest producers of this chemical viz Neste OY of Finland, and ENI of Italy. Canadian demand is low but expected to rise as lead in gasoline will be banned perhaps by 1990 December. Presently 0.2 gm per litre of TEL is allowed and phase down has been advanced. Canadian Government is also contemplating legislation to cut on emissions -- nitrogen oxide by 60% and hydrocarbons by 29%. To meet these standards, oxygenates like MTBE or alcohols are necessary. Methanol supplies are expected from Celanese Canada's 900,000 tpa plant.

In India IOL is said to be planning for MTBE production in a small way and perhaps the methanol producers may seek this outlet if they are assured of isobutylene.

For Competitive Imports of Chemicals, Pharmaceutical
Raw Materials and Particularly for the Following Items

Dimethyl Amine
Bisphenol A
Beta Naphthol
Nitro Benzene
Para Nitro Toluene
Ortho Nitro Toluene
Meta Nitro Toluene
Aniline Oil
Acetanilide

PLEASE CONTACT WITH YOUR SPECIFIC REQUIREMENTS

CHEMET केमेट

CHEMET

HEAD OFFICE:
Taj Building, 1st Floor, P.B.No. 195, 210, Dr. D.N. Road, Bombay: 400 001
Phones: 2043803/4/5/6/7 Fax. No. 2048854
Cable: DEGUCHEM Bombay Telex: 11-3229/11 4631 DGKM IN

CALCUTTA OFFICE:
Sharma House, 3rd Floor, 1/2 Lord Sinha Road, Calcutta-700 071
Phones: 447306 ■ 446155, Cable: DEGUCHEM Calcutta, Telex: 21-33 25 DGKN IN

MADRAS OFFICE:
10, Kondy Chetty Street, 1st Floor, P.B. No. 1709, Madras 600 001. Cable: DEGUCHEM, Madras
Phones: 582447 ■ 587617 ■ 580796 Telex: 41 7554 DGKM IN

DELHI OFFICE:
214, Hans Bhavan, Wing No. 1, Bahadurshah Zafer Marg, New Delhi - 110 002
Phones: 3311373 ■ 3319787 ■ 3319791 Cable: DEGUCHEM New Delhi,
Telex:31 65921, DGKM IN.

HYDERABAD OFFICE:
905/2, 9th Floor, Babukhan Estate, Basheerbagh, Hyderabad-500 001.
Phone : 242318, Telex: 0425 - 2188, DGKM IN.

New industrial policy in the current session of the Lok Sabha

The Union Industry Minister, Mr. Ajit Singh has said the new industrial policy of the Government would be announced before the end of the current session of Parliament.

Talking to newsmen at Coimbatore on May 5, Mr. Singh said that the thrust of the new policy would be on development of industries in rural areas and promotion of exports. The new policy would also aim at correcting the regional imbalances in industrial growth and increasing employment opportunities.

Investment subsidies, discontinued two years ago, would be revived. But it would be available only to small-scale units set up in backward and rural areas, he said.

It would encourage the setting up of more and more small-scale units in rural areas to check the migration of rural labour cities, and modernisation of existing small units to produce goods of international standards.

Earlier, addressing the Indian Chamber of Commerce and Industry, Mr. Singh said that liberalisation in issuing industrial licences would continue in a phased manner as the Government could not do away with licensing in view of the serious balance of payment problem.

The Government would do everything to help the industry increase exports. It would also support modernisation to enable it to face the competitive world market. The Indian industrial sector had for long been protected and the time had come now for producing goods that could compete in the international market.

SSI dispersal

Addressing a regional seminar on "problems and prospects of small agro and rural industries", the Minister said the Centre wanted to ensure widespread dispersal of small-scale industries for creating employment opportunities especially for rural youth, halting the flow or rural labour to urban areas and ensuring equitable distribution of income.

He said earlier efforts of the Union and State Governments to take the small industries to the rural and backward areas had not been very successful. About 85 per cent of the small units were concentrated in the four metropolitan cities and other major cities and towns in the country.

Only the remaining 15 per cent was spread over semi-urban and rural areas and they were mostly traditional artisan-based units.

Mr. Singh said only industrial complexes, set up near major cities and backward areas eligible for subsidies, recorded fast development leading to a steady flow or rural youth, especially educated unemployed, to the metropolitan cities.

He voiced concern over the problem of sickness afflicting the small-scale sector and called for a serious introspection to identify pitfalls and pinpoint solutions for the smooth and sustained growth of this sector.

Another problem area for the small sector was that of modernisation. As in many cases, this sector still depended on age-old manufacturing techniques.

It could further increase its share in total industrial production, employment and export if it opted for systematic modernisation to produce products of international standards.

The Government was conscious of the need to increase employment opportunities and an exercise was under way to evaluate the real magnitude of the problem facing the small sector.

Mrs. Subbulakshmi Jagadeesan, Tamil Nadu Minister for Social Welfare and Rural Industries, who also addressed the seminar, said that the State Government had set a time limit of 30 days for giving statutory and other clearances by Government departments.

The district-level advisory committees had been instructed to closely monitor cases of delay and ensure their prompt disposal.

Mrs. Jagadeesan pleaded for adequate supply of pig iron, steel sheets, paraffin wax and wire rods by the Centre to the small industries in the State.

She also urged that freight equalisation which was presently available only for iron and steel should be extended to other raw materials so that the units were not put to a competitive disadvantage. It would also ensure a wider dispersal of industries and a balanced growth.

SPIC, TAC CHIEFS REPLACED

The Chairmen of two joint sector units — Southern Petro Chemical Industries (SPIC) and the Tuticorin Alkali Corporation (TAC) were changed due to irregularities in their management, the Chief Minister, Mr. M. Karunanidhi informed the State Assembly on May 7.

He said the Government dealt with them firmly by replacing them with State Chief Secretary, Mr. M.M. Rajendran (Chairman, SPIC) and Home Secretary, Mr. R. Nagarajan (Chairman, TAC).

Mr. Chidambaram's family owned only 12 to 13 per cent of the equity shares in the SPIC.

For Your Import Requirements Of

Mono Ethylene Glycol
Di Ethylene Glycol
Tri Ethylene Glycol
Polypropylene Glycol 2000
Cyclo Hexanone
Cyclo Hexane
MIBK
Isophorone
Tetra Hydrofuran

Please Contact:

PRIYA CHEMICALS

HEAD OFFICE :
Podar Chambers, 4th Floor, S.A. Brelvi Street, Bombay: 400 001
Phones: 2860596 ■ 2863611 ■ 2863676 ■ 2863783 ■ 2863900
Telex: 011-5495 PRIA IN ■ 011-2472 PODR IN

BRANCHES

— HYDERABAD OFFICE —
Prashanthi Commercial Complex, 6-9-30/6 to 8/B, 2nd Floor, Basheerbagh,
Hyderabad - 500 029 Phone: 236068

— DELHI OFFICE —
Flat No. 8, 10th Floor, Akash Deep Bldg., Barakhamba Road, New Delhi-110 001
Phones: 3314512 ■ 3310413

— BANGALORE OFFICE —
Devatha Plaza, 131/132, Residency Road, Bangalore-560 025 Phone: 214027

— MADRAS OFFICE —
No. 5, Manikeswari, Kilpauk, Madras-600 010 Phone: 663632

— CALCUTTA OFFICE —
"LORDS", 3rd Floor, 7/1, Lord Sinha Road, Calcutta 700 071 Phone: 44-0358 ■ 44-6867

PIB approval soon for TN aromatics project

The final clearance by the Public Investment Board (PIB) for the Rs. 1356-crore aromatics project, National Aromatics and Petrochemical Corporation Ltd., (NAPCO) in Tamil Nadu is on the cards. It is to be set up in the joint sector by the Southern Petrochemical Industries Corporation (SPIC) and Madras Refineries Ltd. (MRL). There was heavy speculation that the project would get shelved unless the State Government put its full weight behind the project. What provoked further speculation was the proposal for clearance of a similar gas cracker project in Salimpur, Uttar Pradesh. This project is also in the joint sector, with JK group co-partnering the UP Government.

However, official sources indicate that clearance for both units is on cards following Centre's survey that enough market is available for end products of both the units. The State Government's and environmental clearance for the SPIC project have already been obtained. It is learnt that the Union Minister of Petrochemicals, Mr. M.S. Gurupadaswamy, had recently refused to give a positive reply to a question on the subject when he was in Madras. However, positive indications were made through the Prime Minister whom the State Chief Minister, Mr. M. Karunanidhi, met later.

Again, in the light of the fact that Central investment in TN has not been forthcoming lately, the Centre is understood to have reasured the State Government on clearance of their projects.

The first stage clearance by PIB for the aromatic complex had come in August, 1989. The LI had been issued in February 1987. In November 1988, SPIC was choosen to co-partner MRL, a public sector enterprises. In March 1989, NAPCO signed an agreement with Toyo Engineering for its project report. The report came through by July 1989. Ever since, the project has been awaiting final clearance.

The MRL-SPIC aromatic complex is likely to go on stream by 1992. It is expected to give a boost to several end-user industries. The mega complex is to manufacture value-added products and import substitutes. The production plan is purified terephthalic acid (PTA) 2,00,000 tonnes, orthoxylene 30,000 tonnes, benzene 30,000 tonnes and paraxylene 1,36,000 tonnes annually.

With the aromatic project to go on stream SPIC will touch the Rs. 1,550-crore turnover-mark by 1992.

FACT RIFE WITH SPECULATION

As Fertilisers and Chemicals of Travancore Ltd. (FACT) headless since March last, it is being asked in FACT as well as management circles in the state who would be the new helmsman of the organisation.

According to informed sources, the company is likely to remain headless for some time more. Whether this could affect the operations of the giant enterprise, especially when its ambitious expansion-cum-diversification project for the manufacture of caprolactam and ammonium sulphate is in the final stage, remains a moot point.

Technically FACT does have a head for the finance director, Mr. S.M. Jain, has deputed as managing director since Mr. M. Chandran left.

The former's professional competence and capability to lead FACT is undisputed. Only, Mr. Jain, unlike Mr. Chandran, has kept a low profile. Nevertheless, when it comes to professional ethics and financial matters, Mr. Jain has never hesitated in asserting himself, often incurring the displeasure of his colleagues.

At a time when FACT's position is not comfortable, hard decisions are called for and the million dollar question is whether Mr. Jain fits the bill. The question assumes significance in view of the reported unhealthy trends in FACT's elections in the changed set-up. Many group, with their own axes to grind, are vyeing with each other.

The search for FACT's chief is more than an year old. Even when Mr. Chandran was in office, the Union ministry was looking for a successor. Interviews were conducted by the Bureau of Public Enterprises (BPE) and two persons were shortlisted of whom one happened to be a former chief general manager of FACT. However, the appointment did not materialise. There are rumours that the appointment was torpedoed by interested parties.

MGCC OPENING DEFERRED

The Maharashtra Gas Cracker Complex (MGCC) set up by Indian Petrochemicals Corporation Ltd. (IPCL) in Nagothane is to be commissioned within a fortnight. The cracker was to be commissioned, but it had to be postponed due to some minor technical problems. IPCL will be cracking liquefied petroleum gas (LPG) unit such time Oil and Natural Gas Commission commissions its gas fractionation unit in Uran. This is expected in June. After feeding hydrocarbons it will take about a week for producing ethylene. The LDPE EO/EG and PP plants are all ready waiting for the feedstock. The polypropylene plant is already in production based on propylene transported from IPCL's Baroda facilites. The HDPE/LLDPE plants are to be commissioned later in the year sometime in September.

The Public Investments Board (PIB) has, meanwhile, cleared the proposal for expanding MGCC's ethylene capacity from three to four lakh tonnes a year, subject to environmental clearance.

SEVENTH PLAN

Antibiotics, Vitamins A tablets prices up

The prices of antibiotics and Vitamins A tablets (brand names), which come under the category of "essential drugs", have significantly risen in the Seventh Plan. The pharmaceutical industry, however, claims that the prices (in this industry) have risen to a lesser degree than in other sectors of the economy.

The price of 30 tablets of Aquasol A, for Vitamin A deficiency, went up by 178.3 per cent between August 31, 1985 and February 28, 1990. (This is a point-to-point comparison).

The increase has been significant in the case of the following antibiotics, the time period or end points being the same as aforesaid. Chloromycetin, 250 mg. (12 capsule package) manufactured by Parke Davis (79.9 per cent), Sporindix, 500 mg. and 250 mg. (Ranbaxy) (112.5 and 105.7 per cent, respectively), Caporan, 500 g. vial (Glindia) (77 per cent) Erythrocin 100g. (Abbot) (60.5 per cent), Ambistryn-D 100g. (Sarabhai) (68.2 per cent) and Fenidure (vial) (Wyeth) (69 per cent).

The All-India Drug Action Network a consumers forum, says that the decontrol measures announced in December, 1986 to promote the growth of the pharmaceutical industry has not brought down the prices of essential and non-essential drugs.

However, one can make a few observations in this regard. In some cases, the price of a drug increased more between August 1985 and April 1988, many between April 1988 and February 1990. However, in a market of many formulations it is not possible to say whether this is the effect of DPCO, 1987.

A senior official in the Drug Control Department of the Health Ministry feels a party can well cite isolated instances of inflation or deflation in support of its argument.

He said that in the context of a market swamped by formulations, it would not be fair to make such judgements.

The increase in prices of antibiotics and vitamin A can be associated with a shortfall in the production of bulk drugs. It was earlier pointed out in these columns that the production of antibiotics and Vitamin A was seriously short of requirement.

The prices of some non-essential drugs, which are supposedly decontrolled and exposed to market forces, have indeed gone up. The B-complex category has shown itself to be inflationary. The price of Arovit 50,000 IU by Roche (eight capsule pack) went up by 88.3 per cent between August 1985 and February 1990.

Similarly, Redexon, 200 mg. and 5 ml. pack of 500 mg. manufactured by the same company went up by 97.5 and 124.4 per cent, respectively between the aforesaid dates.

The price of Calmpose (5 mg) manufactured by Ranbaxy rose by 102.60 per cent between August, 1985 and February 1990. Novalgin (10 tablets) manufactured by Hoechst similarly went up by 75 per cent. May and Baker's Avomine used to combat nausea and vomiting shot up by 155.26 per cent in the same period. The price of Buscopan (5 ml.) manufactured by German Remedies as a drug for abdominal pain, rose by 115.86 per cent in the aforesaid period. The prices of some anti-asthmatics, antihistamines and cough expectorants have also been on the rise. The industry and the officials in the Drug Control Department aver that apart from a sample not being illustrative of the whole, it is too early to comment on the effects of DPCO, 1987.

MANUFACTURERS OF

REACTIVE DYES

Please Contact Us For Export of Your Products:

Mr. DHAIRESH K. SANGHVI

M/s. KANTILAL SANGHVI & CO.

Union Co-operative Insurance Bldg.,
23, Sir Pherozeshah Mehta Road,
BOMBAY 400 001.
Phones: (Office): 2870836/2873217/2873628
(Resi.): 4226850/4229086
Telex: 115725 EXIM IM Gram: EXPIM, Bombay
Fax: (22) 2874153

EFFLUENTS DISPOSAL

Show-cause notice on 22 firms

The Maharasthra Pollution Control Board (MPCB) has served show-cause notices on 22 major chemical, pharmaceutical, textile and dye companies at Thane, objecting to their disposing of the industrial effluents through a public sewer (nallah).

The MPCB, in its identically-worded notices served on the individual companies, has alluded to the State Environment Department's recent decision to disallow the discharge of effluents through a local public nallahs. It has told the industries concerned that it intends to revoke its earlier permission to continue with the disposal of effluents into the nearby creek through a public sewer and to prescribe fresh conditions for discharge of treated effluents through individual or public sewer into the saline zone at an approved point.

Prominent among the companies which have been served with notices are Bayer (India) Limited, Garware Paints, Aniline Dyestuffs Pharmaceuticals Pvt. Ltd., J.K. Chemicals, Raymond Woollen Mills, Kiran Spinning Mills, Bombay Wire Ropes Ltd., Goodlass Nerolac Paints Ltd., Indofil Chemicals Company, C. Raman & Company Pvt. Ltd., Catalyst (India) Pvt. Ltd., Chase Bright Steel Pvt. Ltd., Sandoz (India) Ltd., and Roche Products Ltd. Most of these industries are located on the Kolshet Road and surrounding localities of Thane.

All these companies have been instructed by the MPCB to let out their effluents either through individual underground sewer or ones created by the local authorities for ultimate disposal at a safe point in the saline zone of the Thane creek. They have been asked to submit their time-bound proposal for providing the disposal arrangements through the underground sewerage systems. The deadline set by the MPCB for submission of proposals is one month and one year for completion of the new disposal system.

The Thane Manufacturers' Association (TMA), a representative body of the industries in the area, has taken up the issue with the State Environment Secretary, Mr. P. Subramanyam, and asked him to advise MPCB not to pursue with the matter pending, and appraising him of the situation. The TMA office-bearers are to meet Mr. Subramanyam some time this week for a detailed discussion on the issue.

When contacted, a TMA spokesman said that though the industries were in total agreement with the MPCB about safe disposal of effluents through underground sewers into the saline zone of the creek, it would not be possible for individual industries to comply with MPCB's requirements, owing to several reasons.

He said that his Association had intimated to the State Environment Secretary, through a recent communication, that it would not be possible for the individual industry to seek legal permission for complying with MPCB's requirement, since they did not have access to the lands between the creek and their units.

He said MPCB should realise that it would be technically impossible for the individual units to lay underground sewer lines to the safe point in the saline zone of the creek.

According to him, the units concerned are ready to discharge their effluents through a common sewer, if it is made available to them as suggested by MPCB.

He felt that the Thane Municipal Corporation (TMC) was the competent authority to lay such a sewer line in the area. In fact, the TMC was obliged to lay the sewer line under the provisions of the Bombay Municipal Corporation Act, 1949, he added.

"34TH YEAR OF SERVICE"
A RELIABLE & DEPENDABLE HOUSE FOR CHEMICALS & SOLVENTS PARTICULARLY FOR
CAUSTIC SODA LYE
(In Tanker Loads)
Consumers Kindly Contact
PURCHASE & SALES EXCHANGE
345, Samuel Street, Bombay 400 003.
Telephones: 327129/341105/6887582
Tlx.: 011-74476 ATTN.: 0398 Fax: 287-1441 ATTN.: 0398
011-74498 ATTN.: 0398 287-2220 ATTN.: 0398
ESTD.: 1955
Associates: TEJ ENTERPRISES

FOR YOUR IMPORTS AT COMPETITIVE CIF PRICES

Beta Naphthol
Methyl Chloroformate
Propylene Glycol
Dimethyl Carbonate
o-Chloro Benzaldehyde
Propiophenone
1,4-Dioxane
Succinic Acid
Glyoxyllic Acid
Methane Sulphonic Acid
Methane Sulphonyl Chloride
o-Chloro Phenyl Acetic Acid
Cellosolve
Perchloroethylene
Diglyme
Dimethyl Sulphoxide
Morpholine
Dinitro o-Sec-Butyl Phenol
Diethyl Hydroxylamine 85%
Guaiacol
Epichlorohydrine
p-Chloro Toluene
o-Chloro Toluene
BHA
p-Hydroxy Phenyl Acetamide
Lactose BP/USP

Please Contact for further details:

S. AMIT & CO.

A TRUSTED NAME FOR IMPORT OF YOUR CHEMICALS
105, Neelam Centre, "A" Wing, Hind Cycle Road,
Worli, Bombay 400 025.
Phones: 4934627-28/4933310 Telex: 011-76877 CMIT IN
Cable: "DULICTOL" 011-74486 AMIT IN
Fax No. 22-494950-4
Madras Office: Queens Court, 134, Montieth Road Madras-600 008.
Phones: 860172/866942
Hyderabad Office: 8-3-215/7 (First Floor), Srinivasa Nagar Colony (West),
HYDERABAD-500 890
Phone: 35110

Our Associates: M/s. CHEM AMIT

LOW OFFTAKE FROM HBJ PIPELINE

GAIL seeks advance payments

Following the low offtake of natural gas by Anta and Auraiya power plants from HBJ pipeline, Gas Authority of India Ltd., (GAIL), had demanded that it be allowed advance payment equivalent to four months consumption of gas at the time of signing of the contract with a provision to forefeit the same.

In case the gas is abandoned or delayed, in all furture arrangements with its customers. In a note to the Government, GAIL has also asked for power to cancel the allocation of gas if the project fails to proceed according to the agreed schedule.

Further, GAIL wants minimum demand charge of 80 per cent of gas allocation by the consumers.

The penalty clauses to be introduced by GAIL in its contract are expected to be fought tooth and nail by the Union Power Department. Power sector is the largest customer of GAIL, besides fertiliser industry.

GAIL has pointed out that gas-based power stations on account of their relatively high variable costs, are the lowest in the despatch order. This is further exasperated by the fact that technically gas-based power stations are the easiest to back out. Consequently, gas consumption is erratic with wide daily and seasonal fluctuations. This is confirmed by the drawal pattern of gas observed at Auraiya and Anta so far. While GAIL has contracted for four million cubic metres of gas per day (MCMD) to NTPC for their Anta and Auraiya plants, the actual drawal has been considerably lower. With the committment of a minimum of 96 MCMD per month of gas (at 80 per cent as minimum drawal) should have been taken by NTPC. On the above basis, the minimum quantity of gas taken during 1989 should have been 1170 MCMD. Against this, the actual drawal during 1989 was 465 MCMD, resulting in a loss of revenue of Rs. 160 crores to GAIL.

Such an erratic offtake by power stations vis-a-vis the committed offtake, according to GAIL would impose unbearable financial burden on the producers, such as Oil and Natural Gas Commission and Oil India Ltd., and transporters.

Given the choice, it is pointed out, the gas supplier would prefer to make most of the supplies to continuous process and other industries which take gas as per commitment rather than to the power stations.

The consumption pattern, according to GAIL, has an adverse impact on the gas production and supply system, as also creates problem for the operation for downstream petrochemical plants. Consequently, GAIL feels that provision of storage adjacent to power plants is critical for ensuring the modulated flow for both the downstream and upstream. Such systems, it is felt would need to be designed and costs incorporated in the tariff structure for the efficient functioning of the system.

The Power Department, according to GAIL, would also need to determine the units which it would wish to work as base load station and the plants which would be used essentially for peaking purposes. This, it is felt, is critical for managing the gas transmission and production system.

To meet the demand of the power plants identified for peaking, it is felt that a dedicated storage near the power plants is necessary. The Power Department is believed to have also agreed to the proposal that storage should be provided around such power plants and the cost passed on to the consumers.

It is felt that this arrangement would enable the power plant to draw higher quantity of gas from the storage during peaking hours and help to create a line pack during non-peaking hours.

CHEMICAL TRADE'S PLEA

The president of the All India Manufacturers' Organisation (AIMO), Mr. Kamal M. Morarka, has urged the government to reduce customs and excise duties for the chemicals industry, expedite clearance of licence applications and allow free import of technology to boost the export of chemical and allied products.

He also called for a reduction in price of feedstock naphtha gas and creation of a competitive atmosphere by encouraging establishment of manufacturing capacities marginally in excess of projected demands to achieve realistic prices.

With these measures, the exports of chemicals and allied products could be increased several times from the present level of Rs. 2,000 crores, Mr. Morarka contended. He said more industries should be delicensed and broadbanding be extended to include more items, to ensure steady growth of the chemicals industry.

Mr. Morarka also stressed the need to constitute a standing committee on trade and tariffs to monitor international prices and availability of vital inputs on a continuing basis, and to suitably adjust import duties and controls in such a way that the interests of consumers and manufactures are balanced.

OIL PRICES MAY RISE TO $ 18 A BARREL

Oil prices are expected to rise gradually in the next "six to eight weeks" to reach the 18 dollar per barrel OPEC reference price level, said Indonesian minister of mines and energy Ginandjar Kartasamita, reports QNA-POOL.

India Glycol resumes MEG production

India Glycol's mono ethylene glycol (MEG) plant has resumed production late last month after being forced to shut down earlier in the face of considerably cheaper imports. The company has been successful in pushing its product in the market at a profitable level of Rs. 23,000 per tonne of MEG. Expectations are that the situation may improve in the next few months, once the international price of MEG takes an upswing. India Glycol had been a victim of what is termed as a global price war, which brought down the landed price of imported MEG sharply enough, despite an import duty hike from 90% to 150 per cent in the last budget, to force the Indian company out of production.

MEG import prices fell from $1200 a tonne in the third quarter of 1989 to around $360 after two Saudi Arabian multinationals started dumping the material in India. It is claimed that Union Carbide and a Canadian multinational, which have a near-monopoly in the world market, started flexing their muscles in the US and European markets, forcing the Saudi Arabians to concentrate on markets nearer home. Lower raw material costs enabled the Saudis to market MEG at cheaper prices.

It is learnt that a lot of domestic consumers have fallen for the lower prices and interest-free credit offered by the Saudis. The multinationals have a full order book position for the next three months or so. The Indian manufacturers have now made a strong plea to the Union government to place MEG imports in the limited permissible list. It is argued that the Union government is getting less by way of revenue from MEG import duty, despite a duty hike, due to the sharp fall in price. The total revenue generated by MEG imports last year was Rs. 89 crores. After the duty increase (from 90 to 150 per cent), the revenue generation was expected to be in the region of Rs. 137 crores, but the fall in price will now mean a revenue generation of only Rs. 80 crores.

Import restriction is also being argued for on the ground that the demand-supply gap in MEG will be fully bridged by next year once new capacities that are being set up come into stream. The manufacturers claim that the government may have hinted on a move to restrict imports if the recent directive by the finance ministry to the petroleum ministry to restrict the import bill for crude oil and petroleum products is heeded.

Despite the imported price being pegged at Rs. 16,000 per tonne, domestic producers have been able to sell their product at higher prices because of old links and co-operation from consumers. "They (consumers) know that the present price scenario will not last long and they will have to bank on us in the long run", claims one manufacturer.

Meanwhile, the last year may not have been financially as bad as had been generally expected. No specific figures are yet known, but the considerably higher price fetched by the company when international prices were ruling high would mean a lower net loss. India Glycol is the first plant in the world to manufacture MEG from molasses. MEG is an insubstitutable raw material used to make polyester staple fibres and yarns.

HIND CIBA'S PROJECT IN GOA CLEARED

Yet another project of the Hindustan Ciba Geigy, belonging to the ICI group, involving an investment of Rs. 22.30 crores, has been cleared by the government. The proposed project is for the manufacture of speciality chemicals and it will be set up in Goa. The Goa plant will have a capacity of 1200 TPA of speciality chemicals for detergents, textiles and dyes. Hindustan Ciba already has a unit at Santa Monica, territory of Goa.

FOR MOST COMPETITIVE CIF OFFERS FOR:

Gum Rosin
Beta Naphthol
O.T. Liquid
and other Chemicals

Please Contact:

M/s. K. SANGHVI & CO.

308, 'Gulab' 3rd Floor,
237, P.D 'Mello Road,
Bombay 400 001.

Phone: Office: 2612232/2610711 Resi: 8128473/8226451
Telegram: KEYSANGHVI Telex: 11-73516 KSC IN
Fax No.: (22) 2618970

ICI seeks buyers for Thane unit

ICI India Ltd. is understood to be looking for buyers for its ailing 30,000 tonne polyester staple fibre (PSF) unit at Thane, near Bombay, according to a report in the Economic Times.

Informed sources claim that ICI contacted rural Indian business groups including Mr. H.S. Ranka of the Rajasthan based Modern Group for a deal. Though an ICI spokesman in Delhi stoutly denied any move to sell the plant, Mr. Ranka confirmed that an offer was indeed made to him.

He said that the PSF unit is located in over a hundred acres of prime land and would have served as an important raw material source for his textile units. But he claimed that the unit was saddled with heavy underutilisation of capacity and a large work force.

ICI sources confirmed that the unit had faced problems on account of increased cost of raw materials and a competitive market situation.

Selling prices were under pressure and the profitability eroded, so much so that the plant had to be shut down for a while. The plant's capacity utilisation was in the region of an uneconomical 50 per cent.

ICI expanded the plant's capacity from 10,000 tonnes to 30,000 tonnes per annum last year, but clearly the timing was wrong as the industry was already saddled with high extra capacity.

The situation has shown some improvement, with the fall in prices of vital raw materials, like mono ethyl glycol, but it will be a long way before full recovery takes place.

As part of a strategic decision, ICI is keen on disinvesting assets which in its opinion are not in line with the long term interest of the company. Instead, the company wants to concentrate in high technology products in collaboration with its mother company, the London-based Imperial Chemical Industries Plc.

ICI has already disposed of its low density polyethylene (LDPE) plant in West Bengal to Mr. Abhey Oswal last year at a price of Rs. 14 crores.

The unit was lying closed because of non-availability of alcohol, a crucial raw material. Mr. Oswal has since restarted the plant.

The company's water treatment chemicals business was sold to Nalco Chemicals Ltd. in 1988.

Negotiations were also on with Mr. Oswal for the sale of the fertiliser complex at Pankhi. But the deal is reported to have fallen through after the change of guard at the Centre.

CONTACT FOR MOST COMPETITIVE CIF PRICE FOR

ANILINE OIL/NITROBENZENE
BETA NAPHTHOL/M.T.D. MIXTURE
BUTYL-ETHYL-METHYL GLYCOL
CYCLOHEXANONE/T.H.F.
D.O.P./D.M.F./M.E.K.
HYDRAZINE HYDRATE 80%
M.P.D./PARA CRESIDINE
PHENOL/BISPHENOL A
3 CHLORO 4 FLUORO ANILINE
DIETHYL MALONATE
2,6 DICHLORO ANILINE
1,3 DICHLORO BENZENE
MORPHOLINE
SODIUM CYANIDE
SULFADOXINE/SULPHADIAZINE
TERTIARY BUTYL AMINE

SATYAN PHARMACEUTICALS PVT. LTD.

DIAMOND HOUSE, 491-493, KALBADEVI ROAD, BOMBAY - 400 002.
Tele.: 250050 & 316250 Telex: 011-5210 SPL IN

Branch Office:
114, Thambu Chetty Street, Madras - 600 001
Tele.: 513967 & 510851

Star Chemicals

FOR YOUR IMPORT REQUIREMENTS OF

- Cyclopropyl Carbinol
- Cyclopropylcyanide
- Cyclobutylmethyl Bromide
- 6-Chloro 1-Hexanol
- 4,4-Diphenyl-2-Butanone
- 1,2-Epoxy-3-(Alpha Naphthoxy) Propane
- S-(+)-Lactic Acid
- Nadic Acid Monomethylester
- N-Methylformanilide
- Thiopivalic Acid
- Thiopropionic Acid
- 2-Hydroxymethyl-1,4-Benzo-dioxan
- Piperonyl Alcohol
- N-Piperonyl Piperazine
- Aziridine-3-Propanol
- 4,4-Difluoro Benzophenone
- Benzophenone-3,3,4,4-Tetra-carboxylic Acid-3,3-Dimethyl-ester
- N,N,N,N-Tetraethyl-4,4-Diamino benzhydrol
- 4,4-Difluorobenzhydrol

And for other Chemicals, Pharmaceuticals & Intermediates

PLEASE CONTACT WITH YOUR SPECIFIC REQUIREMENTS

MADRAS OFFICE:
D-4, 2/36 RAMS SQUARE
2, Village Road
MADRAS 600 034
Tel: 864430/8250097
Tlx: 041 25164 STAR IN

HYDERABAD OFFICE:
'NALANDA' Unit No. 7
6-3-649, Somajiguda
Hyderabad 500 482
Tel: 210288
TLX: 0425-6131 STAR IN

OUR LOCATION DOES NOT MAKE ANY DIFFERENCE TO OUR COMMITMENT TO SERVE YOU

Drug price controls may be eased further

The Government is aiming at further relaxation of drug price controls during the Eighth Plan, according to the annual report of the Department of Chemicals and Petrochemicals released recently.

The annual report has this to say about the Government's goals in this industry: "The Eighth Plan is being framed with a view to fostering the growth of pharmaceutical industry keeping in view the objectives of the national health plan and the need to ensure better production, for availability of drugs at reasonable prices and for encouraging greater exports of drugs".

On pricing, which determines production and availability to a large extent, the report says: ".....it is hoped that further relaxation of price controls will be made possible with the ultimate aim of complete decontrol of prices, so that Government will retain only the power to impose control in respect of those products where it is considered necessary on a selective basis".

However, this goes against what the Petroleum and Chemicals Minister, Mr. M.S. Gurupadaswamy, has said on the subject addressing a press conference at Bombay last month. He said more drugs will be brought under price control as and when necessary. It is not clear whether this shows a reversal of the Government's thinking on the subject. What is more probable, it shows the confused thinking of the National Front Government on the subject.

The department's action in implementing the recommendations of the Kelkar panel have been recounted, until the Minister turned the tables and brought 21 decontrolled drugs under control. Four bulk drugs namely paracetamol, rifampicin, timolol and sulphacetamide have been shifted from the First Schedule to the Second Schedule. Similarly 15 bulk drugs have been deleted from price control.

The following bulk drugs have been allowed exemption from price control under DPCO for a period of five years from the date of commencement of commercial production on the ground of indigenous research and development: Ranitidine (Ranbaxy Labs), metoclopramide (IPCA Labs) and dextropoxyphene (Wockhardt).

It is possible for companies to get certificates from the Government research institutions to the effect that they have deveoped indigenous technology for any drug. This enables the company to launch the product and get exemption from price control for five years, which can compensate for inefficient technologies.

In the meanwhile, they can apply for permission for foreign collaboration for "technology upgradation". Some in the industry consider it a racket, saying one who developed a process indigenously is equipped to spend more time and effort to upgrade the technology.

The following are among the foreign collaborations approved till November 1989: Penicillin-G, (upgradation), pain killers and balms, amino acids and derivatives, controlled release formulations, cephalexin, nifedipine, pindolol, C acid, loperamide, thioridazine and captopril (upgradation).

6 MT OIL REFINERY FOR ORISSA

The Union Minister of State for Petroleum and Chemicals, Mr. Bhajaman Behera announced at Bhubaneswar on May 7 that Orissa would soon have a six million tonnes capacity oil refinery at Daitari in Cuttack district. He told a news conference that the refinery, one of the three proposed to be set up in the country, over and above the one to be set up in Assam as per the Assam accord, would cost Rs. 1,466.56 crores. He said crude would come from Paradeep port to Daitari, and from there refined oil would go to Allahabad, through pipeline. The proposal had already been forwarded to the Planning Commission for approval, he added.

FOR ATTRACTIVE CIF PRICES OF

PARAFORMALDEHYDE (SPANISH)

89%, 91%, 93%, 96%, 97%

CONTACT:

FLURODYECHEM

SWAGAT CO OP. HOUSING SOCIETY BUILDING 3/A, BLOCK NO. 1, L.B.S. MARG, BOMBAY - 400 086

Phone: 581958/587264

Cable: FLODYES, Bombay 400 086.

Telex: 011-75806 FLOR-IN

Seminar on technology upgradation in drug industry

Small Industries Service Institute (SISI), Hyderabad and CSIR-Polytechnology Transfer Centre (PTC), Hyderabad organised jointly a one-day seminar on the title theme on Saturday the 24th March 1990 at Hotel Ritz, Hyderabad. Professor B.R. Sant, Scientist-in-Charge, PTC (Hyd.) welcomed the gathering and Professor A.V. Rama Rao, Director, Indian Institute of Chemical Technology (IICT), Hyderabad, who was also the Chief Guest at the function, inaugurated the Seminar.

Mr. K. Prasada Rao, Director, SISI presided over the inaugural function. Dr. D.R. Rao Managing Director, Neuland Laboratories Ltd., Hyderabad delivered the key-note address. Nine papers were presented in two technical sessions: one presided over by Professor A.V. Rama Rao and the other by Professor B.R. Sant. Mr. S.L.N. Rao, Deputy Director, SISI proposed a vote of thanks.

In his welcome speech, Professor Sant explained the objectives of the seminar and the role and functions of PTC (Hyd.). The four principal objectives were (i) create awareness in the small scale industry (SSI) sector about the urgent need for technology upgradation and modernisation, (ii) bring Research, Industry, Promotional, Financial and Consultancy organisations together for a dialogue, (iii) suggest implementation plan for technology upgradation, and (iv) focus the respective roles of SISI and PTC (Hyd.) in bringing about modernisation in drug industry. Professor Sant very briefly mentioned the major functions of PTC (Hyd.) viz.: promotion of indigenous technologies, counselling to entrepreneurs, and assitance in solving technological problems of SSI.

Dr. D.R. Rao in his key-note address said that it is due to technology upgradation that the prices of basic drugs, once three to four times costlier than the international price, had now become cheaper in India. Technology upgradation does not mean extensive modifictions by involving substantial investment, but small little changes in the process which could bring down cost of production, Dr. Rao said. Improvement in the product quality is also technology upgradation. Dr. Rao extensively referred to his experiences in the manufacture of 16 DPA from diosogenin, betamethasone and salbutamol sulphate where gradual process improvements were introduced to reduce the cost of production.

He pointed out that technology upgradation may become necessary also due to environmental and health reasons. Dr. Rao advised introduction of proper 'systems approach' in manufacturing field before one could think of technology upgradation. He emphasised the importance of investigative approach in process optimisation which relies heavily on analytical chemistry and statistical methods. Dr. Rao concluded his address with the dictum 'technology upgradation is a never ending process'.

Professor A.V. Rama Rao, in his inaugural address presented a scenario of the drug industry development in the country since the independence days. He said that until 1970, the drug industry in the country could not take roots mainly because of the hindrance of patent laws introduced during the British rule. With the introduction of new Indian Patent Law by Pandit Jawaharlal Nehru, the Indian drug industry has slowly taken a shape and gradually developed.

Today in the export bulk of drugs India has achieved the distinction from 16 crores worth drugs export in 1970 to the

less developed countries to the 700 crores worth bulk drugs and 300 crores formulations to the developed countries including USA and USSR. The enterprising ability of the Indian entrepreneurs, favourable conditions in the international market and the present patent system are all responsible for achieving the above target, Professor Rama Rao said. He strongly felt that for further development of the Indian drug industry and to withstand the international market competition, the existing patent laws should continue for atleast another ten years.

Stating that India has tremendous potential in the drug industry, Dr. Rama Rao stressed the need to concentrate on invention of drugs. He said that the IDPL established in the early sixties gave a boost to basic drug industry and Hyderabad became the country's major basic drug centre. Although nearly 9000 small scale units are in existence in the country, Dr. Rama Rao deplored that the majority of them did not have the basic quality control facilities. Many of them were duplicating the products based on the same technology.

The Financial Corporaitons are financing such units without realising the problems which is not only causing depletion in the resources but also creating adverse effects on the drug industry. Professor Rama Rao felt that the drug industry should come up based on the country's needs and the opportunities in the international market. Dr. Rama Rao further stressed that any drug industry which starts in the SSI sector should not remain stagnant but should develop over a period of time to a medium-large industry if not a very large industry. He also advised for a common effluent treatment plant for the small scale drug industry units, which is presently in practice in Gujarat as per his advice.

Professor Rama Rao observed that despite fairly good resources, scientific manpower and talented technologists, India has not developed a single outstanding drug. He emphasised the need for right and dedicated people whether in industry or in R & D. Professor Rama Rao further stressed the need to strengthen quick and reliable quality control testing facilities in the SSI sector. At the end of his 45 minutes inaugural address, Professor Rama Rao illustrated through slides the new developments particularly the R & D work at IICT-Hyderabad in the area of drugs.

Mr. K. Prasad Rao in his presidential remarks explained the role of DCSSI in technology upgradation, the various incentives and facilities offered by the Government and the assistance given by SISI-Hyderabad.

BIRLA JUTE TO PHASE OUT CARBIDE PRODUCTION

Birla Jute and Industries Ltd., which suffered a drop in profits in 1989-90 compared to the previous year, primarily on account of poor performance of the calcium carbide division and unremunerative cement prices in the first half of the year, plans to phase out its carbide manufacturing facilities.

The carbide unit, located in West Bengal, will be replaced by ferro silicon production facilities and the company has applied for a letter of intent to manufacture the same. Addressing a press conference on April 30, Mr. S.K. Ghosh, president of the jute and carbide division of the company, said that the existing furnaces can be used for the manufacture of ferro silicon with a little bit of modification in the production process. This will require an additional investment of Rs. 2 crores.

The company plans to produce around 10,000 tonnes of ferro silicon, which is required for the manufacture of alloy and special steels, per annum. Taking advantage of the broadbanding policy, the company also proposes to manufacture other ferro alloys in future.

Mr. Ghosh said that the high cost of power in West Bengal plus the competition of another carbide plant in Bhutan had made the carbide unit totally uneconomical and was proving to be a drag on the company's overall performance. A decision had, therefore, been taken to phase out carbide manufacturing gradually.

Giving an overview of the company's performance during 1989-90, he said that the synthetic division performed satisfactorily and the aim was now to give exports a thrust. The division exported Rs. 45 lakhs worth of cotton and synthetic blended fabrics in the year under consideration to Bangladesh, Singapore, Switzerland, Italy, France and Portugal. The division is being modernised to manufacture superior products for the export market.

The company's cement plants are also being modernised and the management has drawn up a Rs. 160-crore investment plan for the overall modernisation of all divisions over the next five years. Nearly 70 per cent of the amount is to be spent on cement plant updating and increasing capacity to a total of 3.75 million tonnes from the present three million tonnes. The investment will be financed by a World Bank loan of nearly Rs. 50 crores under the bank's energy conservation programme while the balance amount of Rs. 110 crores is proposed to come from internal accruals.

Commenting on the performance of the jute division, Mr. M.D. Poddar, president (commercial) of the company, said that the performance of the industry on the whole continued to be under strain. However, the jute division is planning new type of jute goods production for exports which is expected to give good results. Jute goods exports in 1989-90 was Rs. 26.43 crores compared to Rs. 19 crores in the previous year. Birla Jute and Industries achieved a turnover of Rs. 1,467 crores compared to Rs. 404 crores in 1988-89.

Unitop
SURFACTANTS

NONIONICS

ETHYLENE OXIDE CONDENSATES
OF
NONYL PHENOL, OCTYL PHENOL,
FATTY ACIDS, ALCHOHOLS, AMINES
USED AS
WETTING AGENTS, EMULSIFIERS, LEVELING AGENTS
SOLUBILISERS, CLEANING AIDS

WE ALSO OFFER

SPIN FINISHES	ANTICAKING AGENTS
DETERGENTS	DEGREASING AGENTS
CORROSION INHIBITORS	LEVELING AGENTS
DEMULSIFIERS	CONING OILS
DEFOAMERS	ANTISTATIC AGENTS
DISPERSING AGENTS	AGRO EMULSIFIERS

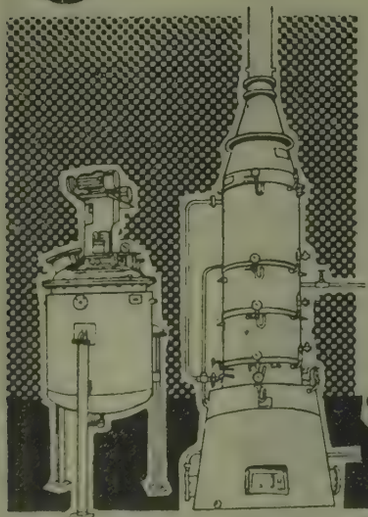
CONTACT MANUFACTURERS

UNITOP
CHEMICALS PRIVATE LIMITED

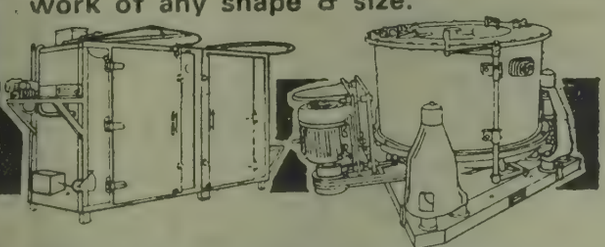
Factory: A-18, M.I.D.C. PATALGANGA, RAIGAD DIST. TEL: 317
Sales Office: 34-35, ISLAM BUILDING, 46, VEER NARIMAN ROAD
OPP AKBARALLYS, BOMBAY-400 023
TEL: 204 8406, 204 6906, 512 5077, 512 5409, TELEX: 011-3654 TPPL

SHARE OUR EXPERIENCE & KNOWLEDGE OF SURFACTANTS

COME AND BE A
SUCCESSFUL ENTERPREUNER WITH US.



Your only right source for plant & machinary equipments such as, NON IBR Vertical Boiler, Tray dryers, Hydro extractor, Pressure Vessels, Pulveriser, Textiles Kier, Winches, Dairy equipments, Road Milk Tanker, and Many more besides, heavy and light duty structural and fabrication work of any shape & size.



DO DROP A LINE OR CALL US.

anu
DESIGNERS & FABRICATORS

C-1/12, G. I. D. C. ESTATE, OPP. : AMBICA NAGAR SOCIETY,
ODHAV, AHMEDABAD-382 415. **PHONE: O. 887188**

LET OUR EQUIPMENTS PLAY A SMALL ROLL
IN YOUR GREAT SUCCESS.

Available Regularly at Most Competitive Prices

Acetone
Acetic Acid Glacial
Aluminium Sulphate
Butyl Acetate
Butyl Acrylate Monomer
Carbon Tetrachloride
Caustic Soda Solid/Flakes
Copper Sulphate
Citric Acid
Di Ammonium Phosphate
DI Ethylene Glycol
Formaldehyde
Formic Acid
Gohsenol GH-17
Gold Bronze Powder
Hydrogen Peroxide
Hydrosulphite of Soda
MCA (Monochloro Acetic Acid)
N Butyl Alcohol
Oxalic Acid 98/99%
P.V.A. 173, P.V.A. 208
Polyethylene Glycol
Potassium Carbonate
Potassium Bichromate
Rangolite C
Sorbitol Liq.
Sodium Bicarbonate
Sodium Alginate
Sodium Bichromate
Sodium Nitrite
Sodium Perborate
Sodium Sulphide Flakes/Solid
Sodium Meta Silicate
Titanium Potassium Oxalate
Titanium Dioxide
Trisodium Phosphate
Triethanolamine
Urea Technical Grade
And other chemicals

Please Contact

TRIBHOVANDAS KHIMJI & BROS

Mangaldas Building No. 5,
36, Trikamji Ghia Marg,
(Kitchen Garden Lane)
Bombay 400 002
Phones: Off.: 310132/311385
Resi: 355044
Grams: "SARKEV", Bombay-2

MORE THAN 70 YEARS OF SERVICE TO VARIOUS INDUSTRIES

Unichema International

(UNILEVER GROUP)
West Germany/Holland/U.K./Australia/Malaysia
OFFERS

for LUBRICANT INDUSTRY
-- Hindered Esters
-- Non-Hindered Esters

for SPIN FINISHES (As Lubricants)
-- Glycerol Trioleate
-- n-Butyl Stearate
-- Iso-octyl Stearate
-- Pentaerythritol Esters
-- Trimethylol Propane Ester

for POLYOLEFIN INDUSTRY
(Plastic Additives)
-- Stearamide
-- Erucamide
-- Oleamide
-- Ethylene-Bis-Stearamide
-- Stearic Acid
-- Glycerol mono-oleate
-- Glycerol mono-stearate

For imports into India and further details, Please Contact:

AGENTS IN INDIA

soofi enterprises

1317, Dalamal Tower, 211, Nariman Point,
BOMBAY - 400 021.
TEL NOS: 224689/233074
TLX NO: 011-4187 SUFI IN
CABLE: SOOFICHEM; FAX NO: 2047657

RUKMA-CHEM
Offers

NONIONICS

BASED ON NONYL PHENOL OCTYL PHENOL, CASTOR OIL, FATTY AMINES ETC.

POLYSORBATES 20, 60, 80,
EMULSIFYING WAX
CETOMAGRAGOL 1000

P.E.G.	200	P.E.G.	1450
P.E.G.	300	P.E.G.	3000
P.E.G.	400	P.E.G.	4000
P.E.G.	600	P.E.G.	6000
P.E.G.	1000	P.E.G.	8000

EMULSIFIERS : DEMULSIFIERS
ANTISTATIC OIL : CONING OIL ETC.

CALCIUM SALT IN BUTANOL
70% ACTIVE

Contact Manufacturers

Rukma-Chem Products P. Ltd.

Office: SM Bhavan, Plot No. B-7 & B-10,
Road No. 8 & 15, Wagle Industrial Estate,
Thane 400 604. Maharashtra.
Tel. No.: 509383/594144/594145
Telex: 011-79380 SMIM IN Fax: 31-22-6344985
Works: W-89(D), M.I.D.C., Chemical Zone,
Taloja, Panvel, Dist. Raigad.
Phone: 410 TALOJA

Investment limit of small units with good export record up

The government will raise the investment limit for small-scale industrial units with a good track record of exports. The commerce ministry has cleared the proposal. The newly created Department of Small-Scale Industries is now examining it.

No consensus has as yet been reached on the increase in the limit on investment in plant and machinery of small-scale industrial units. The finance ministry is also involved in the discussions to decide on the hike in the limit.

The proposal to raise the investment limit of SSIs with a good export record is novel. All earlier proposals for raising investment limit had no linkage to export performance of the small units.

The government's objective is clear. It wants to encourage efficient export production in the small-scale sector. It is argued that the present limit of Rs. 35 lakhs does not allow a small unit to upgrade its production facilities to compete in the international market in a big way.

Any such attempt will raise the unit's investment above the prescribed limit and disqualify him of the fiscal and other benefits like excise exemption and exemptions from various procedures. Thus, a small unit is discouraged from launching an export drive because of the investment limit.

The proposed hike will most likely be in addition to the general increase contemplated in the present investment limit for all small scale units. In other words, a special investment limit will always be prescribed for small units with good export record. This will be higher than the existing general limit prescribed for all ordinary small units.

The proposal was mooted in October last. The industry ministry had then worked out a scheme in consultation with the commerce ministry. The proposal was to be cleared by the finance ministry. It was also agreed then that the next inter-ministerial meeting to be taken by the finance secretary would consider the proposal.

However, the announcement of general elections came in the way of an early clearance of the proposal. After the National Front Government came to power in December, the proposal was revived. The new government felt that even though the commerce ministry has cleared the proposal, it should be examined afresh by the newly ceated department for small-scale industries. At present, small units are reported to be accounting for 20 per cent of the country's total exports.

Please Contact For Prompt Supplies Of:

ANHYDROUS
AMMONIA GAS

IN 5/7/9 TONNES CAPACITY ROAD TANKERS AND IN 40/50/60 Kgs. CAPACITY CYLINDERS
ALSO AVAILABLE LIQUOR AMMONIA

AMMONIA SUPPLY CO. (Bombay)
22-B, Bombay Samachar Marg, Above George Restaurant, 2nd Floor, Fort, Bombay 400 023.
Phones: Office: 271914, 272245 & 274526 Residence: 6289566 Godown: 4307473 & 4300205

AMMONIA MARKETING CO. (BOMBAY)
125, III Phase, Peenya Industrial Area, Bangalore 560 058. Telephones: 394402, 394379

ASCO ENGINEERING CO.
Sodagar Ice Factory Compound, University Road, Baroda 390 002. Telephones: 328603, 328239
Plot No. 2926, Phase-I, G.I.D.C., Vapi 396 195

AMMONIA SUPPLY CO. * ASCO ENGINEERING CO.
18, New Colony, Model Basti (Near Filmistan Cinema) New Delhi 110 005. Phones: 776142, 779644

Also Available

NEW CYLINDERS FOR AMMONIA & CHLORINE
DULY APPROVED BY C.C.E. NAGPUR AND CERTIFIED BY B.I.S. NEW DELHI
BRANCHES AND ASSOCIATES ALL OVER INDIA

BLANKET ADVANCE LICENSING SCHEME

Ministry notifies norms

The Ministry of Commerce has notified procedural and other details regarding value addition in export products under the blanket advance licensing scheme introduced in the new EXIM policy. A blanket advance licence holder will not be eligible for issue of an advance licence for the same export products.

The period allowed for export obligation under the scheme is 18 months from the date of issue of the licence. Normally, no extension will be allowed. According to a public notice issued by the Chief Controller of Imports and Exports, the export order to cover the imports will have to be produced within 45 days from the date of incorporating the particulars of imported items in the blanket Duty Exemption Entitlement Certificate (DEEC) book.

The facility of intermediate processing is available to a blanket advance licence holder subject to certain conditions. The Hand Book of Procedures has been amended accordingly. Applications for such licences will be considered by the Blanket Advance Licensing Committee (BALC).

The notification has stated that the procedure relating to fixation of input-output norms for export products (mentioned in para 346) will be applicable to the blanket advance licensing scheme also. The condition governing the grant of blanket advance licences include:

The licence will be available only for the product range for which the applicant holds a valid industrial licence/-permanent Directorate of Industries certificate.

The applicant fulfils the eligibility conditions laid down in Paras 253 & 255 of the import policy.

Only items which are related to the export products and to the extent estimated as required for fulfilment of the export commitments would be imported. The conversion of raw materials and components into resultant products involves substantial manufacturing activity.

The scheme is applicable only to those export products which provide a minimum overall value addition of 50 per cent or as may be fixed by BALC or such higher value addition for export products specified in Appendix 13-D of the policy. Within the overall minimum value addition limits fixed in the Blanket Advance Licence, the exporter may, in respect of individual export products, other than those specified in Appendix of 13-D, achieve a lower value addition upto a minimum of 33 per cent. BALC may consider requests for lowering the value addition further in individual export products, upto 25 per cent on merits and on a case to case basis.

Before getting clearance of imported items against Blanket Advance Licence, the licence holder should approach the concerned licensing authority for incorporating the particulars of items being imported with item name, value and quantity, both on the licence and Blanket DEEC Book. The licensing authority would ensure that such requests are dealt with expeditiously and on the following basis.

In case the export product for which the items are sought to be imported is covered by the input-output norms given in Appendix 13-C or has already been fixed by the BALC earlier in his own case, the details of such input-output norms would be indicated by the licence holder while seeking incorporation of such items. These norms will be incorporated in Part C (Section II) of the Blanket DEEC Book.

In case the input-output norms have not been fixed for the export products, the incorporation of the items shall also be made immediately by the licensing authority based on the request made by the licence holder. The licence holder will, however, apply to the BALC for the fixation of norms with all details including the export order, within 45 days from the date of such incorporation. The Input-Output Norms fixed by BALC will be final.

In case the licence holder is already in possession of the relevant export order at the time of getting the items incorporated, the particulars would be indicated in part E of the Blanket DEEC Book. Otherwise, it would be incumbent on the part of the licence holder to produce the relevant export order within a period of 45 days from the date of such incorporation and also get the particulars incorporated in Part E of Blanket DEEC Book.

The facility of intermediate processing is available to a Blanket Advance Licence holder provided the name of intermediate manufacturer is endorsed in the Blanket DEEC Book prior to making imports. This will be required even for products covered by Appendix 13-E of the Import Policy.

The licence holder shall submit the full details of utilisation of imported materials specified on the licence against various export products in the prescribed format to the concerned customs authority along with the blanket DEEC book within three months from the date of last export or from the date of expiry of the stipulated export obligation period or extended period, whichever is earlier. In that case, the fixation of input-output norms for one or more products is pending with the BALC. The accounts may be submitted within a period of three months from the date of fixation of norms. Based on the above details and the relevant input-output norms, the customs authorities will determine the balance unutilised materials, if any, left with the licence holder.

If a licence holder fails to discharge the prescribed export obligation either in full or in part, or otherwise left with unutilised balance exempt materials as determined by the customs authorities and the licensing authority/customs authorities and the licensing authority/customs is satisfied that exempt material has not been sold or misutilised for domestic production, and the licence holder is in possession of the excess exempt materials, the following action may be taken by the licensing authority to regularise and discharge the blanket DEEC.

If the export obligation has been fulfilled in terms of quantity but there is a shortfall in terms of value, the licence holder shall be required to surrender valid REP licences of the same product group with a minimum validity period of three months, for a value equivalent to the difference in the export obligation imposed and actually achieved in value terms.

If the export obligation has been fulfilled in terms of value but there is a shortfall only in terms of quantity and the imported materials left in excess are other than those specified in Appendix 13-F of the import policy, the licence holder will be required to pay to the customs authorities all duties alongwith 18 per cent interest on such quantity of exempt materials as are deemed to have remained unutilised as per the approved input-output norms and to surrender valid REP licence for the same export product group with a minimum validity period of three months, for a CIF value equivalent to the CIF value of such excess materials.

In case the imported items are left in excess with the licence holder, then the committee may permit the licence holder to hand over such materials to canalising agency or any other agency nominated by BALC for distribution to actual users. The BALC may also allow the licence holder to retain such excess materials, on payment of customs duty with interest at the rate of 18 per cent on such materials and surrender REP licence of the same product group with a minimum validity period of three months for a CIF value upto a maximum of ten times the CIF value of the excess materials.

If the licence holder is not able to fulfil the export obligation both in terms of quantity and value, he will be required: to pay to the customs authorities all duties alongwith 18 per cent interest on such quantity of the exempt materials are deemed to have remained unutilised as per approved input-output norms and for the shortfall in quantity, to surrender valid REP licence and in addition, for shortfall in value as well. BALC may also permit transfer of excess materials to the subsequent blanket advance licence to be issued to the licence holder provided the excess materials so left over is not on account of default in fulfilment of export obligation, the notification has explained.

KOTHARI GROUP TO FLOAT NEW VENTURE

The D.C. Kothari group have joined hands with the Bombay-based Dalal Consultants to float a new venture in the area of engineering and project management consultancy services in the south. Mr. Ramesh Dalal, chairman, and Mr. P.D. Kothari, director told newsmen that to begin with the joint ventures called "Kothari Dalal Consultants Private Limited", will have a Rs. 20 lakh capital base, with both the partners contributing fifty per cent each.

The company has already bagged orders from the ONGC, PMRL and others and the spokesman hoped that in the years to come, the region would be offering a good scope. This optimism has stemmed from the fast growing petrochemical units and the oil and gas finds in the Cauvery and Godavari basins. The turnkey services being offered by the Kothari-Dalal committee are: project conception and pre-investment studies, transfer of technology/technology identification feasibility reports and DPR-SM and a host of other areas.

T.B.H.Q.

Tertiary Butyl Hydroquinone

Antioxidant for Oils/Foods/Pharmaceuticals

Excellent Quality/Prompt Delivery

Contact Manufacturers:

PANORAMA INDUSTRIES

G-2, Rajhans Society, Manpada Road Corner, Dr. Rajendraprasad Road,
Dombivli (E) 421 201, Dist. Thane, State: Maharashtra

DELAY IN TAKEOVER OF MCF BY RCF

Karnataka government asked to consider proposals made by private firms

In the absence of any reaction by the Government of India to the proposal made almost three months back by the Rashtriya Chemicals & Fertilisers Ltd. (RCF) to takeover the Mangalore Chemicals & Fertilisers Ltd. (MCF), the board of directors of MCF (promoted by the government of Karnataka) has, following a recent meeting, requested the state government to consider alternative proposals made by five to six private firms.

While stating this to the press, the Karnataka Industries Secretary, Mr. B.S. Patil, however, declined to mention the identities of the private bidders. All he would say was that some of them were from within the state and some outside.

While Mr. Vijay Mallya of the UB group has already been mentioned as one of the interested parties, the Chhabrias have also been interested in MCF to the extent of buying into the equity of the company almost two years back, which sparked off rumours at that time that they were planning to take over the company.

The identities of the other three to four private firms who have made offers is the subject of speculation. However, local corporate circles feel that Mr. R.P. Goenka could also be interested. It is not just a question of taking up the challenge of rehabilitating an ailing MCF over 50 per cent of whose net worth has been eroded.

The company owns over 200 acres of land in and around Mangalore which could come in very handy for setting up downstream projects once the proposed Mangalore refinery-cum-petrochemicals complex comes into being.

In fact, almost three years ago, Mr. R.P. Goenka had said on the eve of a FICCI meet in Bangalore that he was interested in the proposed Mangalore refinery-cum-petrochemicals complex project. However, at that time, he had commitments vis-a-vis Haldia, which are no longer binding thanks to the intervention of Darbari Seth.

Since MCF has a low equity base of about Rs. 20 crores, it is felt that any proposal to make the unit viable would entail the enlargement of the capital base through the injection of funds to the tune of at least Rs. 45 crores.

Mr. Mallya is regarded as the front-runner in the MCF stakes, with the UB group having its corporate office in Bangalore. Expectedly, Patil declines to talk in terms of front-runners.

As he puts it, "All these proposals will have to be vetted not only by the state government (which holds 34.3 per cent of the equity of MCF through agencies like the Karnataka Development Corporation, the Karnataka Agro Industries Corporation) but also by the consortium of Central financial institutions and banks (which hold about 20 per cent of the equity. The balance is held by the public)."

The industries secretary is however categorical about one thing. "The state government cannot wait indefinitely for a reaction from the Central government on the RCF proposal. Our first choice of a partner in MCF would have definitely been a Central public sector undertaking.

However, if we wait much longer, MCF might reach a stage where no rehabilitation package will be able to revive it. The state government is seriously concerned since it is not just the promoter of the company with 34 per cent of the equity but is also standing guarantee for loans to the tune of Rs. 42 crores taken by MCF at the time when it set up its captive power plant and a diammonium phosphate (DAP) plant.

The company also owes the state government an outstanding amount of Rs. 15 crores by way of loans and interest. MCF is also facing a severe cash-flow crisis.

"The sooner we identify a partner, the better for MCF. Any further loss and we stand the risk of watching Karnataka's only petrochemicals-based industry being liquidated."

The situation has been further aggravated by the fact that, since April 1, production at MCF has come to a standstill due to a severe shortage of water at Mangalore. Matters are expected to improve only with the onset of the monsoon.

Till then, the company is expected to lose Rs. 3.5 crores a month, estimates MCF's chairman-cum-managing director, Mr. J. Alexander. MCF, which was incorporated in 1966, has a licensed and installed capacity to manufacture 2,17,000 tonnes of ammonia, 3,40,000 tonnes of urea, 63,000 tonnes of DAP and 3,600 tonnes of ammonium bicarbonate.

ASSAM REFINERY

The fourth oil refinery in Assam with an installed capacity three million tonnes per annum will come up during the Eighth Plan.

The Rs. 10,000-crore project in the public sector will be set up at Numaligarh in Golaghat district of Assam. Construction of the project, which would help develop ancillary industries, would start soon.

The Petroleum and Chemical Minister, Mr. M.S. Gurupadaswamy gave this information to the State Janata Dal Senior Vice-President Dulal Baruah at New Delhi.

We Manufacture

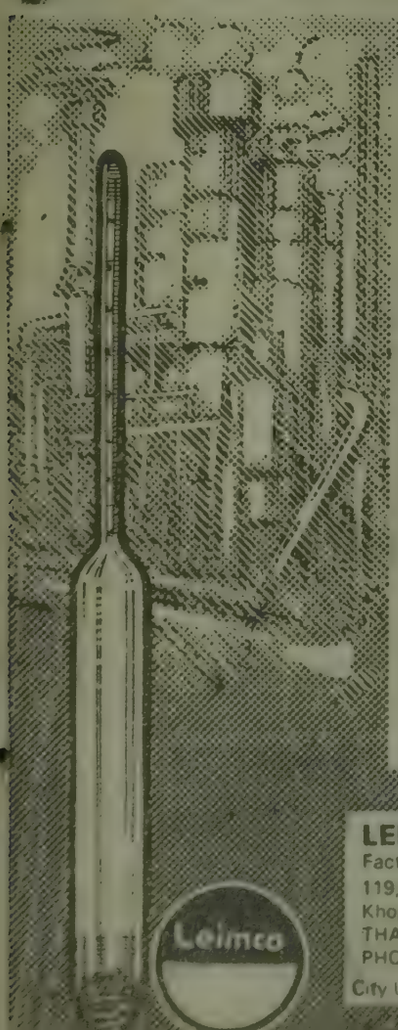
ETHYLENE DI CHLORIDE
DI CHLORO ETHANE
TRI CHLORO ETHYLENE

Contact:

CRYSTAL INDIA

Works: W-114, MIDC II, Manpada, Dombivli 421 204.
Tel.: 5489

Office: Tel.: 6421194/6406525
Telex: 011-74455 PCO IN 011-74456 PCO IN
Begin messages with TD-69 CRYSTAL INDIA



Manufacturers of:

GLASS HYDROMETERS

PETROLIUM ◆ Petroleum

Density Hydrometers as per I.S. 3104 Part I. Specification with ISI Mark

Specific Gravity, Baume, Brix, Sikes, Twaddle Battery Hydrometer, Direct % Reading Thermo-Hydrometers for Caustic Sodalye, Nitric Acid Sulphuric Acid, Hydrochloric Acid, Glue and Ammonia for different purpose.

Our other products :

- *MICRO PIPETTIES (LAMBDA)*
- *CONSTANT TEMPERATURE BATHS*
- *PRECISION INDUSTRIAL GLASS THERMOMETERS*
- *LABORATORY GLASSWARES*
- *INDUSTRIAL GLASS EQUIPMENTS*

3104 ISI PART 1

PRODUCTS KNOWN FOR QUALITY & PRECISION

LEIMCO
Factory :
119, Punjani Industrial Estate
Khopat, Eastern Express Highway
THANE 400 601 (INDIA)
PHONE 502572

LEIMCO
Office
Cavel X Lane, No 4
Kalbadevi Road
BOMBAY 400 002 (INDIA)
PHONE Resi 578335

City Unit 127, Madhani Estate, S Bapat Marg Dadar BOMBAY 400 028

M/s. GROMIT (INDIA)

Available from Ready Stock

* Sodium Hexa Meta Phosphate
* Ammonium Thiocyanate
* Sodium Thiocyanate
* Potassium Thiocyanate
* Mercuric Thiocyanate
* Ammonium Fluoride
* Sodium Fluoride
* Potassium Fluoride
* Magnesium Fluoride
* Calcium Fluoride
* Ammonium Bifluoride
* Sodium Bifluoride
* Aluminium Silicoflorides
* All Bromides
* Zinc Carbonate
* Sodium Iodide
* Lead & Calcium Nitrate
* Sodium Cryolite
* Potassium Cryolite
* Glycine
* Ammonium Carbonate
* Ethylene Thiourea (NA-22)
* Acetamide
* Tin Sulphate
* Hippuric Acid
* Strontium Salts
* Copper Salts
* Phosphate Salts
* Nickel Salts
* All Acetates

Associates:

M/s. CHARMS CORPORATION
M/s. GROMIT INDUSTRIES

229/231, Samuel Street,
R. No. 1, 3rd Floor,
Vadgadi, Bombay 400 003.

Sales Office: Tel. 336381/336382
Resi.: 6147236
Gram: "AMIBHAV"

Two more items under FCO

The Ministry of Agriculture has brought zincated urea and boronated single superphosphate (SSP) under the Fertiliser Control Order (FCO). This has been done to ensure greater benefits and better quality fertilisers to farmers and to help enhance output in micronutrient deficient areas.

Sources in the Ministry have indicated that the Rashtriya Chemicals and Fertilisers (RCF) has been asked to start production of zincated urea which is urea loaded on with zinc, an important micronutrient. Similarly the Dharamsi Morarji Chemicals Company (DMCC) has been asked to resume production of boronated SSP.

It is learnt that the effect of zincated urea on paddy is phenomenal and increases the output by several times. According to official sources, a slow-release fertiliser, urea super granules has also been brought under FCO.

Andhra Pradesh, Tamil Nadu, Punjab, Haryana and Uttar Pradesh have been identified as areas deficient in zinc. These are areas of intense paddy and wheat cultivation thereby draining the soil of its micronutrient content.

Similarly Maharashtra and Gujarat are under intense cotton cultivation and this has led to a severe deficiency of boron. Boronated SSP is also required in areas under groundnut cultivation. The Centre's stand on use of boronated SSP has always been shifting. Though now it is under FCO, pricing still discourages its use as well as production.

It is understood that DMCC was producing boronated SSP till 1986 when owing to a controversy farmers lost the benefit. In June 1986, the Department of Agriculture advised manufacturers that an expert group on micronutrients had recommended that the manufacture and use of boronated SSP should not be encouraged and therefore it was not possible to include it in schedule 1 of FCO, 1985. Simultaneously, the Fertiliser Industry Co-ordination Committee (FICC) stopped payment of subsidy on SSP used in the manufacture of boronated SSP.

Whereas the Government through its foodgrains programmes for wheat and paddy has increased demand for micronutrients by increasing awareness of its importance in the deficient areas, it has so far been unsuccessful in getting the same produced indigenously and in sufficient quantities.

However, with this move, the impact on production is expected to be manifold. In another important move, the Ministry of Agriculture has written to the State Governments through the district agriculture officers asking them to verify stock positions of manufacturers within their areas.

The move has been made especially so in the case of urea manufacturers where official sources say they apprehended over-reporting of stocks by manufacturers within their areas.

UNIPLAS

Uniplas India Ltd. is implementing a major expansion and diversification programme to raise its production capacity of various plastic products from 12,400 TPA to 38,400 TPA by June this year.

The implementation upto a capacity of 25,000 TPA has already been achieved as of date, according to the Chairman and Managing Director, Mr. Bakshi.

The company is coming out with a public convertible debenture issue to part finance the expansion plans. The debentures were likely to mop up Rs. 10.8 crores and the balance for the Rs. 20.2 crores expansion plans would come from banks and financial institutions in the form of term loans.

The expansion project covers not only PVC pipes and fittings, which Uniplas is manufacturing at present, but also a full range of plastic roto-moulded products comprising indoor and outdoor watertanks silos, furniture and automobile fuel banks. The new range of products are being manufactured under the technological assistance of three U.K. companies.

The expansion project is being implemented at the Noida phase II site of the company as well as at the new manufacturing facility located at Daman, near Bombay. The company also plans to enter the export market.

In the current year, Uniplas hopes to achieve a turnover of more than Rs. 50 crores and this Mr. Bakshi says would rise to Rs. 120 crores in 1990-91. The company is also planning to raise the capacities of the new plants in the South and the East. This would increase the capacity to 60,000 TPA. The company has also been paying a high dividend. During the last three years it has paid dividends of 16 per cent, 20 per cent and 25 per cent respectively.

INDUSTRIAL RELATIONS BILL TO BE WITHDRAWN

The controversial Industrial Relations Bill will be withdrawn during the current session of Parliament, labour minister Mr. Ram Vilas Paswan said at New Delhi on May 5. Briefing newsmen after a meeting of the consultative committee of Parliament attached to his ministry, Mr. Paswan said a decision to this effect was taken by the Union Cabinet recently following criticism of several provisions of the Bill by trade unions.

The Bill which was introduced two years ago was kept in abeyance following widespread criticism by political parties. Mr. Paswan said a comprehensive Bill on labour participation in management would also be introduced in the current session of Parliament.

M/S. PETRASOL B.V. (HOLLAND)

Offers the following products:

1. BETA NAPHTHOL
2. CYCLO HEXANONE
3. DIETHYLAMINE
4. DIMETHYLETHANOL AMINE
5. ETHYLENE DICHLORIDE
6. 2-ETHYL HEXANOL
7. ETHYLDIGLYCOL
8. HEPTANE
9. ISO BUTANOL
10. MALEIC ANHYDRIDE
11. MORPHOLINE
12. PHTHALIC ANHYDRIDE
13. PHENOL
14. POTASSIUM FERROCYANATE
15. TRIETHYLAMINE
16. TRIETHANOLAMINE

For imports into India and further details Contact:

SOLE AGENTS IN INDIA

OCEAN TRADING CORPORATION

329, A-Z Industrial Estate,
G. Kadam Marg, (Ferguson Road),
Lower Parel, BOMBAY - 400 013.

Tele No. 4921664/4921669
Telex No. 011-71564 DAYA IN

ANNOUNCING THE RELEASE OF

CHEMICAL WEEKLY BUYER'S GUIDE

EIGHTH EDITION (1989)

3 Volumes, pp. 1868

The most comprehensive survey on the Indian chemical industry to-date. Covering organic and inorganic chemicals, fine chemicals, bulk drugs, dyes, pesticides, fertilisers, paints, plastics, speciality chemicals etc.

BOOK EARLY TO AVOID DISAPPOINTMENT

Copies can be obtained from our offices in Bombay and Madras

Price Rs. 500 (Plus Rs. 75 for postage and handling; and Rs. 7 for outstation cheques) Payable in advance through cheque/demand draft/money order. No VPP please.

Contact

SEVAK PUBLICATIONS

BOMBAY OFFICE:
306, Shri Hanuman Industrial Estate,
G.D. Ambekar Road, Wadala,
Bombay 400 031.
Phones: 4131198, 4120743
Telex: 011-76053

MADRAS OFFICE:
Room No. 9, Wellingdon Estate, 3rd Floor,
24, Commander-in-Chief Road,
Madras 600 105.
Tel.: C/o. 471659/419265

WANTED
AGENTS/STOCKISTS/DEALERS
for the following items

Cocodiethanolamide
Isopropylmyristate/IPP
Ethylene Glycol Monostearate
Emulsiwax - EW/EWL
PEG 4000 Monostearate/Oleate
Silicone Emulsion
Amino Silicone Emulsion
Silicone Defoamers
Antistatic Oil
Cata/Reactive/Nonionic Softener
Dioxide-52/WX
Mould Releasing Agents

DADIA CHEMICAL INDUSTRIES

346, Samuel Street, Vadgadi, Bombay - 400 003. **Fax No.: 287 3480**
Tel: 348745/323718 * Res: 5134435/5121418 Telex No.: 11-3502 NIDA IN

ATTENTION!
FOR LOCAL & EXPORT REQUIREMENTS

NIACIN I.P./B.P./U.S.P.
NIACINAMIDE I.P./B.P./U.S.P.
ISONIAZID I.P./B.P./U.S.P.

BEST QUALITY, REASONABLE PRICE, REGULAR SUPPLY

Contact Manufacturers:

RUPAL CHEMICAL INDUSTRIES PVT. LTD.

74, Matru Smruti, Road No. 4, Scheme No. 6, Sion (East), Bombay 400 022.
Phones: 4077431-32-33, 4090504 Cable: "ALCHEMLAB"
Telex No.: 011-73254 ALAB-IN Fax No.: 0091-22-475524

We offer: TECHNICAL BOOKS, CHEMICAL TECH. REFERENCE BOOKS: AROMATIC CHEMICALS, PERFUMES, COSMETICS & TOILETRY, FLAVOURS & FOOD TECHNOLOGY

PERFUMERY TECHNOLOGY, COMMON FRAGRANCE & FLAVOUR MATERIALS, COSMETICS & TOILETRY FORMULATIONS (1800 FORMULAE), FLAVOUR SCIENCE & TECHNOLOGY, FLAVOURS OF DISTILLED BEVERAGES.
ALSO AVAILABLE - FROM READY STOCK: (LIMITED STOCK):

PERFUME & FLAVOR CHEMICALS (AROMA CHEMICALS) VOL. I-II
PERFUME & FLAVOUR MATERIALS of NATURAL ORIGIN
a single Volume Technical handbook -- by Steffen Arctander
Guenther: THE ESSENTIAL OILS -- 6 Volumes set.
Glasby: THE ENCYCLOPEDIA OF TERPENOIDS - 2 volumes set
Merck: THE MERCK-INDEX -- 11th Edition, 1989

Available Ex-Stock. Please Contact:

DATTANI BOOK AGENCY

B/402, Rajkishor Co-op. Hsg. Soc. Ltd., Murien Street, M.G. Road, Kandivli (W), Bombay-400 067. **Phone: 6062822**

BAN ORDER IGNORED

Officers' stir paralyses work in oil industry

Distribution of petroleum products, oil exploration, drilling and processing of crude was disrupted as over 36,000 oil sector officers throughout the country struck work for a day on May 8 ignoring the ban imposed by the Government under Essential Services Maintenance Act.

The strike by the officers, demanding enhanced dearness allowance on par with Central Government employees paralysed the work in oil industry. The strike also led to widespread dislocation of air service with the Indian Airlines operating limited number of flights.

Although the petrol pumps were not affected, the day's loss in production and disruption in marketing may lead to shortages of petroleum products for a few days. An official spokesman said the strike would cause a loss of Rs. 180 crores to the nation by way of production and sales including $37 million in foreign exchange.

Besides the refineries, all the LPG bottling plants also were shut down. Only minimal operaitons were on in the refineries and other plants so that production could resume without much delay. Officers of the Gas Authority of India Ltd. did not join the strike but extended their support to the striking officers in other establishments by wearing black badges.

The Oil Sector Officers Association convenor, Mr. M. Venkat Rao, said that the "protest strike" by the officers was a "hundred per cent success". He explained that the Cochin Refinery officers did not join the strike as they had preferred to go on a four-day strike. The association did not accept their request, he said.

The official spokesman said in New Delhi that the Indian Airlines could operate only about 50 per cent of its flights. However, oil requirements of Defence and IAF aircraft were fully met, he said.

Though fuelling of civil aircraft was suspended, officers at Patna airport filled up the tanks of a special aircraft in which the Railway Minister, Mr. George Fernandes, flew to Jammu and Kashmir on May 8, Mr. Venkat Rao said.

Giving zone-wise position, Mr. Rao said all oil rigs and drilling platforms of Oil and Natural Gas Commission and Oil India were deserted by the officers and their plants at Hazira and Uran were virtually paralysed. There was no supply of Bombay High gas to Taza Power Station and the Maharashtra State Electricity Board (MSEB) on May 8.

All Oil India installations and refineries in the entire north-eastern region, including Digboi, Guwahati, Barauni and Haldia, were shut down while all pipelines, including Guwahati-Siliguri, Haldia-Barauni, Barauni-Kanpur and Haldia-Moregraim remained dry.

Besides, all administrative officers and commercial establishments of Hindustan Petroleum, Bharat Petroleum, Oil India, Indo-Burma Petroleum and ONGC were deserted by the officers. However, a few officers were deployed at Army and Defence centres to maintain their operations.

The Karnataka Oil Co-ordinator and Indian Oil Corporation Regional Manager, Mr. A.S. Gundu Rao, said officers did not turn up for work except those on the locations. The oil supply position in Bangalore and the other parts of the State was normal. There was no panic buying, he said. A spokesman of the officers' association said the strike was to express their grievances in connection with the Union Government's handling of the dearness allowance issue.

FOR MOST COMPETITIVE C.I.F. PRICES PROMPT & REGULAR DIRECT IMPORT FROM
USA/JAPAN/GERMANY
CHINA/UK/HOLLAND
SPAIN/FRANCE

FOR INDUSTRIAL CHEMICALS, FINE CHEMICALS, SOLVENTS, BULK DRUGS AND INTERMEDIATES
* * * * *
FOR ORGANIC & INORGANIC CHEMICALS, DYES, COLOURS & PIGMENTS, PHARMACEUTICAL, RUBBER, PLASTICS & RESIN INDUSTRIES

Please Contact
With Your Specific Requirements:

THAKKER CHEMICALS & FERTILIZERS PVT. LTD.
MANUFACTURERS, IMPORTERS & EXPORTERS & INDENTING AGENTS

Regd. Office:
307, Mandvi Navjivan Building,
121/127, Kazi Sayed Street,
BOMBAY 400 003.
Tel: 336261, 322719
Tlx: 011-75599 TCF IN

Factory:
Plot No. 1712, GIDC 3rd Phase,
P.O. VAPI, (GUJ). 396 195
Tel. No. Fact: 866 / Resi: 668

Most units of the country's largest Refinery in Baroda were shut down. In the case of ONGC, almost all officers at the regional headquarters at Baroda as well as at the Mehsana, Ahmedabad, Cambay, Jodhpur and Ankleshwar projects struck work. Most oil wells in Gujarat and in the Jodhpur project in Rajasthan were closed temporarily, ONGC sources said.

In Bombay reacting to the appeal made by the Petroleum Ministry, Mr. Rao said the appeal, issued by a Joint Secretary of the Ministry, was received by him at 2000 hrs and he did not have any time to respond to it.

He said many officers, particularly in the rank of general managers and deputy general managers, went underground in fear of arrest under the Essential Services Act. Meanwhile, a meeting of the officers has been convened by him to chalk out its response to the plea made by the Ministry for withdrawal of the strike.

PIPELINE PROJECTS: IOC TO GO AHEAD

The Indian Oil Corporation has decided to go ahead with the construction of the Kandla-Bhatinda and Daitari-Allahabad pipelines which will carry finished petroleum products to a number of States at a much cheaper cost.

According to IOC sources, the controversy between the Railways and the Ministry of Petroleum and Chemicals over the 1454 km Kandla-Bhatinda pipeline which goes through Gujarat, Rajasthan and Punjab had been resolved.

The Railways have been convinced that it would be cheaper to transport finished petroleum products through the proposed pipeline rather than by rail. The pipeline division of the oil company has submitted detailed project reports to the Government. A detailed project report on setting up an oil refinery at Daitari in Orissa has also been submitted. The 828-km-long Daitari-Allahabad pipeline will transport finished petroleum products from Daitari in Orissa.

IOC, which has gained considerable expertise in the pipeline technology, has a pipeline network of 3,850 km. By the end of the century, it will add another 3,000 km. For this purpose, about Rs. 2,000 crores have been earmarked.

The six pipeline units under IOC, spread over eight States and 30 locations all over the country pumped 20.34 million tonnes of crude and petroleum products in 1989-90 surpassing the target of 19.35 million tonnes under the memorandum of understanding signed with the Government by IOC. The pipelines now transport one-third of the crude and petroleum products in the country, and deliver them to consumers at a cheaper price. It also ensures that there is no pilferage, sabotage or spillage.

CCI & E FAVOURS DUTY FREE REP LICENCES

Even the Commerce Minstry and the Chief Controller of Imports and Exports (CCI & E) are unhappy over some aspects of the new import export policy announced on March 30.

Mr. Tejendra Khanna, CCI & E, said this at a workshop on the new import-export policy organised at Madras on May 2 jointly by the Federation of Indian Export Organisation (FIEO) and the Joint Chief Controller of Imports and Exports (JCCI & E), Madras. The purpose of the policy was to provide a supportive policy environment to boost exports, he said.

He pointed out as an example the announcement by the commerce minister at the board of trade meeting reducing the qualifying limit for export houses from Rs. 5 crores to Rs. 4 crores and granting them a grace period of one year to achieve this eligibility limit.

Referring to the dissatisfaction of the commerce ministry and the CCI & E with some aspects of the policy, he said the revenue ministry had opposed some of the proposed measures and since time for hammering out the policy was short, things could not be worked out to the entire satisfaction of the commerce ministry. These aspects, he said, would be worked out in the near future.

To some queries raised by the regional chairman (southern region) of FIEO, Mr. A. Vellayan, Mr. Khanna said the CCI & E had wanted to reintroduce duty free REP licences, but the Ministry of Revenue had raised the objection that exporters may start claiming double benefits for the same consignment both under duty free REP licence and under the modvat scheme. The modalities were being worked out to rule out such a happening before the reintroduction of the duty free REP licence scheme, he said.

Regarding the new system of import of life-saving equipment according to which only certain registered institutions can import these and not individuals, Mr. Khanna said steps had been taken in reaction to complaints received from the All-India Institute of Medical Sciences (AIIMS), New Delhi and other leading medical bodies that medical equipment worth crores of rupees were lying waste because the importers who sold it to these institutions were unable to provide adequate after sales service. So the decision was made to restrict imports to be made only by or through recognised institutions.

Another point raised was regarding the severe staff shortage in the office of the JCCI & E, Madras. Mr. Khanna said the proposal to recruit additional staff to the Madras office among other was pending with the expenditure division of the ministry of finance.

The commerce minister had sanctioned the opening of two offices — one at Coimbatore and one at Madurai.

Crude oil import put at 19.54 mt

Crude oil and petroleum products import for 1990-91 is put at 19.54 million tonnes and 12 million tonnes respectively which will further push up the oil import bill. The annual report of the petroleum ministry for 1989-90 says that during that year the import of crude oil was estimated at about 19.6 million tonnes including additional crude processing of 993 thousand metric tonnes due to better capacity utilisation of the refineries.

Gross import of products is estimated at 7.14 million tonnes and the foreign exchange provision for these imports is about Rs. 6,400 crores, the report says. While the import of crude drops marginally, that of petroleum products rises sharply between 1989-90 to 1990-91, the report shows.

Between April to December 1989-90, crude oil imports were 14,226,000 tonnes involving a foreign exchange outgo of Rs. 2,911 crores. That of POL products during the same period was 47,44,000 tonnes involving a foreign exchange outgo of Rs. 1,590 crores. Production of crude oil in 1989-90 is likely to be 34.07 million tonnes against the production of 32.04 million tonnes achieved in 1988-89.

There was a substnatial increase in the supply of natural gas, against the supply of 8.07 billion cubic metres in 1988-89. The sale in the current year is expected to be 9.4 billion cubic metres. Oil/gas structures have been discovered in Adiyakkamangalam in Tamil Nadu, Andada in Gujarat, Khoraghat in Assam, Lingala in Andhra Pradesh, in Bombay offshore and Kutch offshore.

The plan outlay for 1989-90 of the petroleum ministry was Rs. 3,448 crores and the revised plan outlay was fixed at Rs. 3,694 crores, with a budgetary support of Rs. 214.46 crores and the balance to be met through internal and extra budgetary resources. The overall profit before tax and profit after tax made by the oil sector during 1988-89 was Rs. 3,329 crores and Rs. 2,567 crores respectively.

This is expected to increase to Rs. 3,270 crores and Rs. 2,587 crores respectively during 1989-90. The profit before and after tax likely to be generated by the sector during 1990-91 is estimated at Rs. 3,246 crores and Rs. 2,610 crores respectively. In 1988-89, the fourth year of the Seventh Plan, total actual internal resources generated by the companies was Rs. 2,359 crores. The actual plan expenditure was Rs. 3,184 crores.

In 1990-91, companies in the oil sector are expected to generate Rs. 3,463 crores as internal resources, available for meeting the plan outlay of Rs. 4,091 crores. However, keeping in view the budget support (mainly re-lending world bank loans), the plan outlay of Rs. 4,091 crores will be financed to the extent of Rs. 3,463 crores (85 per cent) through internal resources of the companies, Rs. 150 crores (four per cent), through budgetary support and about Rs. 478 crores (11 per cent) through extra budgetary support tax.

The ONGC produced 23.48 million tonnes of crude during April to December 1989 against the target of 31.61 million tonnes for the year. Offshore fields contributed 16.32 million tonnes. Oil India's production during 1989 was approximately 2.02 million tonnes till December end and it was hopeful of achieving production target of 2.70 million tonnes during 1989-90.

To supplement oil exploration activities of national companies the government invited bids from experienced international companies for oil exploration in 27 offshore blocks in the country. Production sharing contracts for oil exploration in nine blocks have been signed. They are for Krishna-Godavari offshore, Chevron International, Texaco Exploration India, International Petroleum (Bermuda) and Amoco India Petroleum Co. and for Palar offshore (Texaco Exploration).

ATTENTION! ACTUAL USERS!

SULPHURIC ACID in Tanker Load
SULPHAMETHOXAZOLE I.P./B.P./U.S.P. Grade
MANGANESE ACETATE Tech. & L.R. Grade
AMMONIUM PHOSPHATE Mono & Di Basic L.R.
AMMONIUM OXALATE L.R.
SODIUM OXALATE L.R. * OXALIC ACID L.R.
CITRIC ACID * H. ACID * R. SALT

Please Contact:

CHEMI UDYOG

195, Dr. Cawasji Hormosji Street, Shree Ram Bldg., 2nd Floor, Bombay 400 002.
Phones: 295286, 314542 Resi: 693066

Petrofils supports Nirlon modernisation plan

Petrofils Co-operative Ltd. has seconded the proposal put up by Nirlon Synthetic Fibres and Chemicals Ltd. to instal new draw twister machines at its plant.

Petrofils, which recently concluded a techno-economic feasibility study of the texturising process at Nirlon, is understood to have concurred with the company view that by introducing new draw twister machines, Nirlon would gain immensely in terms of finer denier and value. The modernisation is expected to cost some Rs. 4 crores, but the Board for Industrial and Financial Reconstruction wanted the project technically evaluated by Petrofils before giving the nod for making investment.

The report of Petrofils expected to be submitted to BIFR shortly, according to sources and once the final approval comes, Nirlon plans to instal the equipment, entirely out of internal accruals. As a declared relief undertaking, there has been no pay out from the company for quite some time.

Nirlon has also proposed to BIFR that it is in the larger interests of the company to take delivery and instal the zimmer plant for tyrecord imported two years ago from West Germany.

As the company failed to clear the consignment in the face of a funds crunch, the plant has been lying in bonded warehouses. Recently a team from the West German manufacturers came and inspected the equipment which is said to be in good condition.

The total cost of this project including payment of duties would be in the region of Rs. 25 crores and the company hopes that the BIFR revival package expected to be announced in the next one or two months, will have necessary provision to meet this expenditure as well.

Originally, Nirlon had plans to sell off the tyrecord plant, and several buyers like MRF were tapped. But now the company has changed its mind especially as the tyrecord industry as a whole is doing well.

The company is currently managed by bank and financial institutions whose stake is close to 40 per cent. The day to day working of the company is in the hands of Mr. P.V. Rao, Finance Director, who happens to be a nominee of the State Bank of India. Nirlon does not have a chairman after Mr. B. Punja bowed out in March. A hunt is on to induct a full-time chairman with technical background. FIS are leaving this job to a consultancy service for finding the right man.

The original promoters have little say in running the company. There are reports that they have pledged their shares with a foreign bank.

OPEC ACCORD ON OUTPUT CUT

The Organisation of Petroleum Exporting Countries (OPEC) agreed to cutback production by 1.445 million barrels per day, at Geneva on May 3, in order to try to stabilise prices.

The OPEC President and the Algerian Oil Minister, Mr. Sadek Boussena, made the announcement towards the end of two days of discussions by the cartel's eight nation market monitoring committee (MMC).

The cartel produced some 23.5 million BPO in April, higher than the official ceiling of 22 million BPD, Mr. Boussena said. The cutback would serve to stabilise prices, which have fallen to $18 per barrel, at a higher level.

Strict adherence by all OPEC members to a new output accord will steady oil prices at current levels of $18 to $18.50 a barrel, the US analysts said. But they noted the initial 50 cent drop in prices following the announcement of the agreement underscores strong doubts in the market that the pact will hold. Without a quick indication of actual cuts, Mymex June crude could slip about $1 to its recent low of $17.35, analysts said.

Mr. Boussena of Algeria warned that the accord to cut output by 1.445 million barrels per day to around 22 million BPD until the end of July will unravel if all members don't strictly abide by it.

Analysts said the likelihood that the pact will crumble is enhanced by the fact that the United Arab Emirates continues to reject the quota assigned to it by OPEC last November. UAE has pledged to reduce its output by 200,000 BPD, but it will still pump 1.9 million BPD, nearly double its assigned quota of 1.095 million BPD.

OIL DEMAND TO GROW 1.5%

Worldwide oil demand is likely to grow by 1.5% in the second quarter of this year but prices are unlikely to firm up much in the near future, the International Energy Agency (IEA) forecast at Paris on May 7.

It said oil use in the 24-member Organisation of Economic Co-operation and Development (OECD) countries was steady at 38.5 million barrels per day (MBD) in the first quarter. Western European demand rose two per cent to 13 MBD, but US demand fell 2.5 per cent ot 19 MBD, the OECD spin-off organisation said.

IEA said overall growth in OECD demand for the year was likely to amount to one per cent to an average 38 MBD. Worldwide oil supply fell 0.4 MBD to 54.2 MBD as the Organisation of Petroleum Exporting Countries and the US cut output, but supply levels were still above those in January and February.

ONGC efforts towards energy conservation

ONGC has outlined various initiatives at different levels in order to conserve oil, utilise energy efficiently and to develop alternate sources of energy. It has declared 'Energy conservation' as one of its thrust areas and in order to meet this corporate objective, it has taken appropriate initiatives at the corporate, regional and project levels.

Energy cells have been created at the corporate, regional and project levels for monitoring energy conservation levels and creation of energy data base, use of energy efficient equipment, utilising gas for power generation, developing non-conventional sources of energy, creating awareness among users, and energy audits.

Monitoring energy conservation data

Energy consumption of the organisation in various activities like data acquisition, drilling, production, cargo operations, and LPD data production are monitored operation-wise and region-wise. The data is compiled in a data bank and is used for various studies and for future reference.

The consumption patterns of various operations in various regions are analysed and strategies to cut down the consumption rate are evolved continuously. After analysing the available data, targets have been fixed to reduce the energy consumption by 5% in 1990-91 in various areas of operation.

Use of energy efficient equipment

The use of energy efficient equipment at ONGC with necessary modifications, in place of obsolete energy guzzlers has reduced energy consumption considerably and helped in savings to the extent of Rs. 50 lakh per annum.

The soft starters used in sucker rod pumps have helped in saving around 3.78 lakh units per year. The efficient use of electricity by using low voltage lamps and electronic regulators has brought about a saving of 15 lakh units.

Expander compressor at LPG plant, Hazira had helped in saving about 28.5 million units per day as compared to conventional compressor. The co-generation plants at Hazira and Uran have resulted in saving of about 40 million units per year on account of waste heat recovery.

Energy from gas

There are about 84 oil and gas well platforms in the western offshore, which feed hydrocarbons, through a complicated network of feeder lines, to the 16 major oil and gas processing and pumping complexes. These platforms are situated in the sea and it is neither practical nor economical to meet the power requirements of these loads from a shore-based power station.

In order to optimise the use of gas, which is available in plenty, gas turbine driven generator packages are used on the platforms to meet their individual power requirements. There are at present 32 gas turbine generator packages in the western offshore to cater to the power requirements. These generators collectively produce about 950 megawatt flour of energy per day. Each of these generators ranges in sizes between 0.8-15 MW.

Non-conventional sources of energy

Non-conventional and renewable forms of energy are the energy sources of the future. Their impact on present day lives has been moderate, but they are envisaged to play a vital role in the coming years.

Areas where non-conventional sources of energy are being used in ONGC include solar thermal heaters in remote work sites, projects, residential buildings, and hospitals. These heaters have a capacity of about 1 lakh litres of hot water per day, thus saving about 4 lakh units per annum. More such water heating units are under installation.

Solar photovoltaic cells at offshore well platforms have helped in saving about 3.45 lakh units per year. A solar powered cathodic protection system has also been installed for the Dabka-Dhuvaran pipeline in the western region.

A breakthrough in tapping wind energy has been achieved by installing 1000 watts wind-driven generator on unmanned platforms of Bombay High. Solar cell and wind mill generator sets at well head platforms are utilised to generate power for charging battery banks of navigational aids and emergency lights.

A pilot project in underground coal gasification is being undertaken in the Western region to exploit coal seams (below 700m) which are unexploitable through conventional mining techniques. It is estimated that this method will generate around 15,000 billion cubic metres of natural gas.

A pilot test using CNG in place of diesel/petrol in various types of vehicles, motors and generators has been conducted successfully in Bombay, Tripura, and Gujarat and the southern region. ONGC plans to invest Rs. 73 crore in its CNG programmes during the Eighth Plan with 38 refuelling stations, 300 kms. of pipelines and 35,000 conversion kits to be installed in select metropolitan areas. This will go a long way in reducing the pressure on middle distillates.

Creating awareness

Educating the general user is necessary for any programme to succeed. For this purpose, various methods have been adopted to spread energy conservation consciousness. Colourful stickers and posters have been distributed and displayed. Energy Bulletins have been started. Video films on energy conservation are being shown at various work centres. Also, energy conservation weeks are being celebrated to further instil the conservation culture in the employees.

Energy auditing

Inhouse energy audits have been initiated at the corporate level and regional levels to monitor consumption in various areas of operations. Regular energy audits have succeeded in identifying and locating energy intensive units and have helped specific improvement programmes.

Also, ONGC is interacting with the Petroleum Conservation Research Association and other state nodal agencies of the Department of Non-conventional Energy Sources of energy at various levels for taking up energy auditing at a broader level.

Future plans

The momentum gained in energy conservation efforts by initiating these measures will be boosted in future. It is proposed to widely adopt energy saving measures by using variable frequency drives, soft starters, speed controllers, improvement in water makers, standardisation of lubricants, various forms of waste heat recovery, and more efficient lighting practices for more efficient use of energy.

Further thrust is proposed to be given to the use of natural gas and non-conventional energy sources. Natural gas is proposed to be used extensively in various areas like absorption chilling for air-conditioning, duel fuel engines, gas turbine with co-generation, and automobiles (CNG) power generation.

Solar energy is envisaged to play a more important role in the future for water heating, distillation plants, navigational aids for offshore structures, and cathodic protection against corrosion for oil and gas pipelines.

It is planned to explore wind energy for energy generation in some of the onshore and offshore installations. The matter is being discussed with the state nodal agencies for assessing the feasibility. Also, scope for electricity generation in proven areas may be explored for the consumption of the state electricity board.

Biomass is proposed to be developed for power generation in ONGC colonies. An experimental plant is proposed to be set up in Dehradun to generate electricity to meet the street lighting requirement. Plans are also afoot to use solar photovoltaics for illuminating isolated locations and at project workshops for battery charging systems.

The Economic Environment Scanning Group of the ONGC has also come out with an energy review on "Energy Conservation and efficient use — a new approach". The review delves into the worldwide energy perspective and demand patterns. The energy scenario in India is analysed and the efficiency and improvement measures are looked into.

It is recognised that for any programme to be successful a strong organisational response and proper policy instruments are necessary. Keeping this in view, policy instruments, initiatives and institutional frameworks are suggested for evolving the conservation culture.

USSR TO ASSIST INDIA IN ALUMINIUM PRODUCTION

Soviet Union is to assist India in expanding its aluminium production for which discussions are underway.

The Soviet Minister for ferrous metallurgy, Mr. Sorafim Kolpakov said that he was happy with the progress made by India in the field of steel and non-ferrous industry.

The minister said that the steel production in the country would increase with the commissioning of the Visakhapatnam steel plant. He said that both the countries were considering to set up new steel projects.

ATTENTION IMPORTERS!!

EMPEE EXPORTS

SEMBODJA
a Van Ommeren Trading Company

We offer Guaranteed Shipments, Consistent Quality and Competitive rates for CHEMICALS, DYES INTERMEDIATES, PHARMACEUTICALS and PLASTICS from CHINA and EUROPE

We have Offices in HOLLAND, BEIJING, SHANGHAI, HONG KONG, INDONESIA and many other parts of the world.

CHEMICALS

GUM ROSIN
ETHYL ACETO ACETATE
O.T. LIQUID
POTASSIUM PERMANGANATE

PLASTICS

PP (Polypropylene) *S*
LDPE (Low Density Polyethylene) *S*
LLDPE (Linear Low Density Polyethylene) *S*
HDPE (High Density Polyethylene) *S*
PVC (Polyvinyl Chloride) *S*
DOP (Dioctyl Phthalate) *A*
PS (Polystyrene) *S*
EPS (Expandable Polystyrene) *A*
(Acrylonitrile Butadiene Styrene) *S*
PA (Phthalic Anhydride) *S*
MA (Maleic Anhydride) *A*
MB's (All Plastic Master-batches) *A*
Compounds (All Plastic Compounds) *S*
TDI (Toluene Di-isocyanate) *S*
MDI (Methylene Di-isocyanate) *A*
PO (Polyols) *S*
PET (Polyethylene Terephthalate) *A*
BR (Butadiene Rubber) *A*
SBR (Styrene Butadiene Rubber) *A*
TR (Thermo Plastic Rubber) *A*

S = Strategic; A = Accessory

PHARMACEUTICALS

GENTAMYCINE SULPHATE BP 80
STREPTOMYCINE SULPHATE BP 80
DOXYCYCLINE HCL
OXYTETRACYCLINE BASE BP 80
OXYTETRACYCLINE HCL BP 80
SULPHAGUANIDINE
SULPHADIMIDINE
SULPHAMETHOXAZOLE
SULPHADIAZINE
ANALGIN
CAFFEINE ANHYDROUS
INDOMETHACINE
PHENYLBUTAZONE
TETRACYCLINE HCL
THEOPHYLLINE ANHYDROUS
FURAZOLIDONE
PAS SODIUM
INOSITOL
ASCORBIC ACID
THIAMINE HCL
THIAMINE MONO
ALBENDAZOLE Min. 98%
PHTHALYL SULPHATHIAZOLE
TARTARIC ACID

Please Contact Agents in INDIA:

Damodar Bldg., 3rd Floor, 105, Princess Street, BOMBAY - 400 002.

Phones: 291213/253377/252513 **Telex: 011-6710 EMPE IN**

Panna field project dragging on

The prestigious Panna field project of Oil and Natural Gas Commission (ONGC) has got lost in the bureaucratic quagmire and suffered heavy cost and time overruns in the process. While the project cost has almost doubled in the last few years, the Government has decided to retender some of the important components of the project which would result in further delay of over two years for completion.

The project has been cleared by Public Investment Board twice, first at a cost of Rs. 570 crores in February 1988 and now again at Rs. 1,148 crores. The feasibility report for the project was submitted way back in February 1987. By the time the first PIB clearance came and the project implementation could be started, the original cost estimate was obsolete. Therefore, it was again sent for PIB approval with a revised cost estimate.

Now the project cost is bogged down over the choice of finding a suitable contractor for process platform complex (PPC), an important component of the project. Over two years have passed since the bids for PPC was opened. The Government has now decided to reinvite the tenders for this job.

In January 1988, three parties —Hyundai Heavy Industries Ltd., South Korea (HHI), Techip Geoproduction, France (TPG) and Mazagon Docks Ltd. (MDL) had submitted their bids. The offer of TPG was rejected as it was not meeting the bid evaluation criteria and the offers of MDL and HHI were shortlisted for further consideration.

MDL's offer was for 36 months against the tender requirement of 22 months and as only HHI's offer was left it was suggested to retender the facilities. The case was discussed in the steering committee meeting held in April 1988.

In a meeting with the Government it was decided that negotiation should be held with MDL and order finalised provided it is able to tie up with experienced agencies. MDL submitted its technical proposal and revised price bid in March. It was decided that original price bids of HHI and MDL submitted on 23.1.1988 should be opened for comparison. Accordingly, price bids of HHI and MDL were opened.

MDL's revised price was Rs. 647 crores, against its original price of Rs. 349 crores and also was technically incomplete. HHI's price after taking into account the increase of five per cent worked out to Rs. 353.37 crores. The case was further discussed with the Government by ONGC and it was decided to either reinvite tenders or to consider HHI's offer and for revalidation if required. The revalidation of tender would result in eight to nine months delay. Therefore, the completion of the platform may slip to pre-monsoon 1993. The prices so received are likely to be higher. Therefore, the consensus view was that bids already received against the present tender should be considered.

The Government convened a meeting to review the offers of MDL and HHI and both were requested its prices from Rs. 647 crores to Rs. 632 crores and indicated a foreign exchange component of Rs. 414 crores.

The issue was again discussed in the steering committee and it recommended award of work to HHI at the cost equivalent to Rs. 387.39 crores with 12 per cent advance. Accordingly, propposal for foreign exchange release was submitted by ONGC to the Ministry of Petroleum and Natural Gas.

But now the Government has asked ONGC to retender the PPC project again. While the entire drill will be repeated in months to come, the project will remain at a standstill.

The Panna field is located about 95 kms north west of Bombay. The proposal for development of Panna field envisages production, processing and transportation of oil and associated gas. It includes installation of eight well platforms, process complex drilling of 69 wells and laying of flow lines from well platforms to the process from the process complex to join the Bassein-Hazira gas line.

The cumulative production to be achieved from the field is expected to be about 12.2 million tonnes of oil and 6975 million cubic metres of gas.

KHOSLA MAY TAKE OVER AS ONGC CHIEF

The Chairman of the Indian Oil Corporation, Mr. S.L. Khosla, is likely to be appointed chairman of the Oil and Natural Gas Commission, informed sources said at New Delhi on May 5.

He is expected to take over from Mr. P.K. Chandra, the acting ONGC Chairman, who has been offered chairmanship of Oil India Ltd., following the retirement of Mr. Surajit Chawliha, the sources said.

PERSONALITIES

Mr. Sarup Chowdhary has been appointed Director (Marketing) of Indian Petrochemicals Corporation Ltd. (IPCL).

Mr. H.L. Mundra, has been appointed Vice-President, Commercial of Hindustan Lever Ltd.

Mr. M.K. Ghosh has been promoted as General Manager (Aviation) of the Marketing Division of Indian Oil Corporation Ltd., Bombay.

Mr. Mahendra Patel was re-elected as Vice-President of the Ahmedabad Textile Mills Association.

Mr. Manubhai Patel was re-elected President of the Ahmedabad Textile Mills Association (ATMA).

Petroleum coke to be imported

India which had a surplus of 56,000 tonnes of raw petroleum coke (RPC) in 1989-90 is all set to emerge as a major importer of this raw material by the end of the Eighth Plan. The shortfall estimated at 66,000 tonnes for the current year is projected to grow to 2.73 lakh tonnes by 1994-95.

To bridge the yawning gap between demand and supply during 1990-91, the Ministry of Petroleum and Chemicals has decided to import 75,000 tonnes of RPC.

The country had opened 1989-90 with a stock of 1.25 lakh tonnes. With a production of 1.96 lakh tonnes, availability during the year added to 3.21 lakh tonnes. The demand during the year by the consuming units totalled 2.65 lakh tonnes, leaving a carry-over stock of 56,000 tonnes, for 1990-91.

According to a recent exercise by the Ministry, total demand for RPC in 1990-91 is projected at 4.02 lakh tonnes. The indigenous production of this vital raw material during the year is put at 2.80 lakh tonnes. The Ministry has put the shortfall at 1.22 lakh tonnes.

Taking into account the opening stock of 56,000 tonnes, the net shortfall for the year thus works out to 66,000 tonnes. However, to be on the safer side, the Ministry has proposed import of 75,000 tonnes, though the shortfall has been estimated at 66,000 tonnes.

It is felt that the physical quantification of the opening stock may not be accurate as it consists of left-over stocks piled up in open drums for several years. This stock is termed as "poor" quality.

While the domestic production is estimated to stagnate in the next four years, the consumption figures are projected at 3.30 lakh tonnes in 1991-92, 3.91 lakh tonnes in 1992-93, 4.24 lakh tonnes in 1993-94 and 4.53 lakh tonnes in 1994-95.

RPC is the raw material for the production of calcined petroleum coke (CPC) which is used mainly in the aluminium and graphite industry. RPC is a by-product in the process of manufacturing high-speed diesel and kerosene.

It is produced in the refineries at Barauni (1,72,034 tonnes), Guwahati (53,000 tonnes), Digboi (7,057 tonnes) and Bongaigaon (68,000 tonnes). Digboi RPC is considered inferior in quality and is not in demand.

The major customers for RPC are: Petro Carbon and Chemicals (Haldia), Universal Hydro Carbon (Barauni), Neo Carbon (Barauni), India Carbon (Guwahati), Goa Carbon Ltd. (Goa), and Indian Oil Corporation at Barauni and Bongaigaon.

THE ADVERTISEMENT TARIFFS FOR CHEMICAL WEEKLY HAVE BEEN REVISED FROM MAY 1990. THE FOLLOWING ARE THE NEW RATES.

FULL PAGE (BLACK & WHITE)

From 1 to 12 insertions	Rs. 3,000.00 per insertion
From 13 to 26 insertions	Rs. 1,850.00 per insertion
From 27 to 52 insertions	Rs. 1,725.00 per insertion

HALF PAGE (BLACK & WHITE)

From 1 to 12 insertions	Rs. 1,500.00 per insertion
From 13 to 26 insertions	Rs. 925.00 per insertion
From 27 to 52 insertions	Rs. 875.00 per insertion

ONE-THIRD PAGE (BLACK & WHITE)

From 1 to 12 insertions	Rs. 1,000.00 per insertion
From 13 to 26 insertions	Rs. 650.00 per insertion
From 27 to 52 insertions	Rs. 575.00 per insertion

Colours for Inside Pages: 25% extra per colour (Colours accepted only for full page)

COVER PAGE

Front Cover	Rs. 15,000.00 per insertion
IInd Cover	Rs. 9,000.00 per insertion
IIIrd Cover	Rs. 8,000.00 per insertion
Back Cover	Rs. 10,000.00 per insertion

UK minister discusses major environmental projects

As a follow up of her discussions with Mrs. Maneka Gandhi, on environmental issues, in New Delhi, British minister for overseas development Mrs. Lynda Chalker, met Karnataka Chief Minister Mr. Veerendra Patil in Bangaloe on May 4.

Accompanied by a team of British consultants, Mrs. Chalker was in Bangalore to discuss major environmental projects in Karnataka that are being funded by the Overseas Development Agency (ODA) of Britain.

As part of its global initiative to promote afforestation of community wastelands and adoption of alternative strategies on the use of chlorofluorocarbons (CFCs), the agency had last year announced the granting of a £40 million aid spread over five years to India. One of the largest such grants made available by the agency to any country, a major chunk of the aid is being utilised to conserve forests in the Western Ghats of Karnataka. Following a preliminary visit in 1989, a team of ODA consultants visited the state for the second time, where they met Mrs. Chalker and forest department officials to discuss the details of the projects and the exact nature of help the ODA would have to provide.

Addressing a press conference in Bangalore after her meeting with the chief minister, Mrs. Chalker pointed out that the multidisciplinary nature of her team — comprising of experts in sociology, economics, ecology, forestry, hydrology — reflected the complex nature of the problems that had to be addressed in conserving forestry. Said Mrs. Chalker, "we are hoping that the first project to utilise the new funds will be to conserve the forests in the Western Ghats. I was glad to meet a team of their progress with the complex nature of the problems they are addressing".

The Western Ghats development programme funded by the ODA for the preservation and regeneration of forests in the region is only the latest instance of British aid in Karnataka. Since 1984, the ODA has been supporting the Karnataka Social Forestry Project with an allocation of £15.13 million, and the Mysore Paper Mills Forestry Project with a grant of £10.75 million. Extended beyond the originally agreed period of five years, British aid for these projects will now continue till March 1991.

While the social forestry project basically is a poverty alleviation programme through afforestation and raising of nurseries by small farmers and the landless, the Mysore Paper Mills project has as its objective creation of 14,000 hectares of industrial plantations of fast growing tree species, mainly for the paper industry.

According to Mrs. Chalker, the projects now supplies and plants species of trees to meet a range of local needs for fodder fuel, fruit and timber, instead of the previously strong dependance on eucalyptus trees alone. Forest committees have been set up under the project to ensure local participation of community plantations.

Reacting to questions on the effects of planting short rotation tree species like eucalyptus, on the soils and hydrology of their sites, experts from the British team claimed that their studies revealed that eucalyptus trees did not create much damage to the water table as was thought earlier. In fact, the ODA along with the Karnataka Forest Department and Mysore Paper Mills Ltd. had been carrying on a project on this subject for the last four years and have so far spent over £1.30 million. According to Mrs. Chalker, the results when available would provide for an informed assessment of the environmental effects of fast growing trees.

Receiving more British development assistance than any other country, India has so far received about £500 million

Available Regularly in Any Grade
CADMIUM OXIDE
CADMIUM NITRATE
CADMIUM ACETATE
Under Development
CADMIUM PIGMENTS * ANTIMONY TRIOXIDE
Contact Manufacturers:
TECHNO CHEMICALS
Bombay Office:
110, Vardhman Chambers,
17/6, Cawasji Patel Street,
Fort, Bombay - 400 001
Phones: 2047360/2041175
Telex: 011-3575 AMBE IN
Baroda Office:
103, Synergy House, Taico Estate,
Gorwa Subhanpura Road,
Vadodara - 390 007
Phone: 329211/321583
Telex: 0175-690 RUBA IN
EXPORT ENQUIRIES ARE ALSO INVITED

over the last five years. Two of the largest British funded projects are Rihand 1 thermal power station and the Hindustan Zinc Mine and Smelter in Rajasthan.

Poverty alleviation programmes are being financed by Britain in areas like primary health in Orissa, fertiliser education in six Eastern States, primary education in Andhra Pradesh, slum upgrading in Hyderabad, Indore and Vizag, apart from social forestry in Karnataka.

CALL FOR ACTION TO CURB GREENHOUSE POLLUTANTS

An international conference of legislators has called for immediate action to curb "greenhouse" pollutants and recommended a "global marshall plan" to help developing countries cope with environmental problems.

Concluding a three-day environment conference, the delegates from 42 countries urged nations to commit without delay to cutting the pollution that causes global warming by a total of 50 per cent over the next 20 years.

The actions by the inter-Parliamentary conference on the global environment are little more than suggestions for an environmental outline and are not binding on any country. But many of the delegates to the conference, hosted by the US Congress, said they would return home to push for legislation along the lines outlined.

The aggressive strategies on global warming contrasted to the approach favoured by the US President, Mr. George Bush, and senior White House officials.

Mr. Bush recently told an international White House conference on the environment that more research was needed before any commitments are made for specific pollution controls. More than 200 law makers from 42 nations, including the Soviet Union, most European countries, Japan and many developing nations, were participating in the conference.

The gathering agreed on a broad range of environmental goals, including actions aimed at protecting the ozone layer, reversing the loss of forests and committing greater resources to population control.

This so-called "global marshall plan for sustainable development and the environment" would be patterned on the post-World War II economic assistance efforts by the US that helped Europe recover from the war, officials said.

In contrast to the recent international White House conference, the legislative delegates in their policy recommendations scarcely touched on the need for more research.

Instead, the delegates called for setting a timetable for specific cuts in global warming pollutants by the year 2010, including a 20 per cent reduction in carbon dioxide emissions, a product of burning fossil fuels, elimination of chlorofluorocarbons, or CFCs, and a variety of other ozone-depleting chemicals and a 10 per cent reduction in methane emissions.

UB GROUP PLANS UNIT IN MYSORE

The UB group is setting up a Rs. 70-crore industrial unit in Mysore, Karnataka Finance Minister, Mr. M. Rajashekara Murthy, disclosed at Mysore on May 4.

According to the Mysore city Congress-I committee president, Mr. K. Javare Gowda, Mr. Rajashekara Murthy said while addressing the newly-elected corporators and part workers, that the proposed industrial unit would ease the unemployment problem prevailing in Mysore.

ATTENTION MANUFACTURERS OF
PERFUMERY, DYES, INKS, DAIRY, EXPLOSIVE, N.C. LACQUERS, LEATHER and PAINTS
READILY AVAILABLE **ULTRA PURE** QUALITY OF
* ISO-AMYL ALCOHOL (128°C - 132°C)
* ISO-AMYL ACETATE
* AMYL ACETATE
* AMYL ALCOHOL
Please Contact for your regular and prompt supply
BOX NO. 1233
CHEMICAL WEEKLY
306, Shri Hanuman Industrial Estate,
G.D. Ambekar Road, Wadala,
Bombay 400 031.

Industries poison Ahmedabad

The uncontrolled and rapid growth of industries in the newly merged area of Ahmedabad has seriously damaged the environment. Over 1000 acres of once fertile land have been reduced to wasteland and hundreds of cattle have died because of chemical effluents discharged by the industries.

The slow poisoning of agricultural land has not only ruined the environment, but has also crippled the social and economic life of thousands of villagers of Lambha, Sahawadi Sai, and Piplaj. The people from these areas are paying a heavy price for the government's liberal industrial policy and its indifference to pollution control.

Until a decade ago, Chandola lake situated just outside Ahmedabad was the main source of irrigation water for several villages in the area. The water was supplied through a network of canals.

But ever since the supply to this lake from the dam in Prantij (Sabarkantha district) was stopped, the villagers had to manage with the little monsoon water. In spite of this, they were able to reap a decent rice harvest.

Then came the sudden boom of industries especially small chemical and textile units in Naroda, Odhav, Narol, Ishanpur, Vatva and other surrounding areas. The water flowed through the canals once again and the unsuspecting villagers gladly watered their fields with it. But they realised that this was not water. The reddish brown liquid, soon converted their rice fields into barren land, and the only sight of vegetation today are the thorny shrubs.

The effluents were systematically discharged through underground pipelines which are emptied out into the canals. Those industries which were not within close range of the canals, dug deep wells into which the water was let out. As a result, even the water in the sub soil was affected. Several bore-wells in the area today give out reddish water. The entire landscape is now covered with large and small ponds of this polluted water. Even the village ponds have been contaminated.

During the monsoon, the water overflows into low lying areas and in some places like Sahawadi, people have to put up with this polluted water right up to their doorsteps. The red, green, and yellow expanses of water breeds numerous mosquitoes. The same is also used for washing clothes as there is no other source of water.

An industrial unit on the banks of one such pond discharges waste chemicals and even sewage water into this pond. The farm lands outside Sahawadi village have been converted into a huge swamp with the water almost waist deep in some places.

The people of the area have simply come to terms with this industrial activity and prosperity. The farmers no longer cultivate their land. They have instead taken to cattle rearing because of the remunerative price of milk.

About four years ago, the people of Sahawadi, Saij and Piplaj were shocked to find over 60 of their buffaloes dead. The apparent cause was consumption of the polluted water. Ever since, about 50 to 60 healthy buffaloes with an average life span of 17 to 20 years have been dying within seven to eight years.

Soon after the people realised that the land had been affected by the chemical water, government help was sought. The government, after some bureaucratic delay, issued notices for the acquisition of their land, which was declared as non-cultivable waste land.

After much persuation, the authorities were made to understand that the land had been converted into waste land and the notices were withdrawn. The people protested against the industrialists and submitted memoranda of ministers. But it was of no avail.

During the monsoon of 1986, the youth of the three worst affected villages had got together and blocked the outlets from the factories. For eight days the factories remained closed. Finally, the owners had agreed to deepen the canals to ensure that the chemical water did not overflow into the village ponds and wells. But the promise was never fully carried out. To date, the situation remains the same and the people have not been paid any compensation for the land lost.

According to the sarpanch of Sahawadi, Mr. Govindhbhai Bharvad, the farmers have been reduced to daily wage labourers. Some have been absorbed into the local units but all have given up cultivation. At night, there is a strong smell of chemical in the area because the units release the chemical effluents at night.

The Gujarat Pollution Control Board has turned a blind eye to the problem. Some of the factories are nothing but sheds and yet they have managed to get recognition. A large number of dyeing units have come up in the area during the last few years. Some of the units are located in plots which were once rice fields.

The local farmers now work as labourers in these units. The chemicals like caustic soda, nitric acid, sulphuric acid and oxalic acid, which are used in the dyeing and bleaching processes, are discharged into the canals in large quantities. Even the dye producing units situated in these areas do not have any effluent treatment plants. The pits, overflowing with waste chemicals and dyes are a common sight in the area. Besides causing grave damage to the environment, these small units, which allegedly are never visited by factory inspectors, have become symbols of exploitation.

WASTE WATER TREATMENT

UASB technology 'viable'

The upflow anaerobic sludge blanket (UASB) technology being tried out for the first time in the country for the treatment of domestic and industrial waste water has proved to be a viable option, the Secretary in the Ministry of Environment and Forests, Mr. Mahesh Prasad, said at New Delhi on May 4.

Inaugurating an Indo-Dutch Workshop on UASB technology, he however, noted that a few deficiencies had been found in terms of design and operation and maintenance and hoped that the Dutch experts involved in the transfer of technology would do their best to overcome these aspects.

The technology has been introduced in the country under the Indo-Dutch integral sanitation project and is based on the upward flow of waste water through a sludge layer of active micro-organisms. The monitoring of the five million litres per day (MLD) UASB treatment plant at Kanpur for the treatment of domestic waste water, he said, had yielded satisfactory results.

However, the performance of the technology in the treatment of tannery waste water is yet to be fully evaluated. Until this was done, Mr. Prasad said, the possibility of proceeding with the other modules of 25 MLD UASB treatment plant and its replication to other parts of the country would not be possible.

Expressing concern about the fast-increasing waste water outflow from the urban cities and industries located on the banks of the Ganga, Mr. Prasad said that under the Ganga action plan, a total of 35 sewage treatment plants (STPs) have been taken up.

While many of the STPs are based on established technology, alternatives are being tried out in a few locations. He said the need, however, is to select technologies which are not only cost-effective but also adequate in resource recovery and puts the least demand on land which is scarce in urban cities. Mr. Prasad urged the workshop participants to discuss in detail the issue of pathogens removal in the UASB treatment process. These discussions, he said, would be a guiding factor for the future module of the UASB plants at Kanpur and Mirzapur.

CANADIAN CONSULTANCY FOR ION EXCHANGE

Ion Exchange (India) Ltd. (IEI), a pioneer and leader in water treatment in the country, has entered into a five-year consultancy agreement with the University of Ottawa, Canada. Under the terms of the agreement, Dr. S. Sourirajan, director of this university's industrial membrane research institute, will provide consultancy to the company on membrane development.

FOR COMPETITIVE IMPORT OF FOLLOWING PRODUCTS

N-BUTANOL
BETA NAPHTHOL
CAUSTIC SODA FLAKES
LACTIC ACID
LACTOSE
ACETONE
ANILINE OIL
CRUDE NAPHTHALENE
EPICHLOROHYDRIN
TITANIUM DIOXIDE
PHENOL
GLYCERINE
STYRENE MONOMER
POTASSIUM FEROCYANIDE
AMMONIUM PERSULPHATE
SODIUM NITRITE
FURFURYL ALCOHOL
BISPHENOL - A
TETRA HYDRO FURAN
DIHYDROPHENYL GLYCINE BASE
SODIUM CYANIDE
METHYL ISOBUTYL KETONE
METHANOL
DIMETHYL FORMAMIDE
MALEIC ANHYDRIDE
ACRYLONITRILE

Please Contact:

VAPOOR CHEMICALS

502, Fifth Floor, 'Keshava', Bandra-Kurla Commercial Complex, Bandra (East), Bombay 400 051.
Tel.: 6424845 Tlx.: 011-71258 VCPL-IN Fax: 6441347 Cable: VAPOOR CHEM

Abuse of power by UCC even before Bhopal mishap

Long before a poison cloud escaped from a Union Carbide plant at Bhopal killing at least 3,500 people and permanently disabling 86,000, the company was fouling the environment and exposing its workers to deadly conditions, says a book just published at New York.

"Abuse of power — social performance of multinational corporations: The case of Union Carbide", is a collection of case studies that presents Union Carbide's record on the environment, health and safety.

Written by David Dempo, Ward Morehouse and Lucindaa Wykle of the Council on International and Public Affairs, a New York-based public affairs think-tank, the book vividly tells of mismanagement and neglect by the US transnational company. For example:

— In the 1930s, thousands of workers were digging a three-mile-long tunnel at Hawk's Nest, in the US state of West Virginia, to divert river-water for a Union Carbide power station.

Up to 2,000 workers died within weeks of their employment on the project after contracting silicosis, a respiratory disease which normally takes 10-12 years to develop. Workers took ill quickly, yet the protective measures that could have saved them had existed for years.

Union Carbide West Virginia plant leaked more than 230 tonnes of various cancer-causing chemicals into the air and water in 1981 alone, and an unreported amount of methyl isocyanate (MIC). In the following three years, more than 100 in-plant leaks of phosgene — used in chemical warfare —occurred. In 1981, 402 employees at a Union Carbide battery plant in Indonesia were found to have kidney disease from exposure to mercury which contaminated the plant's drinking water and surrounding rice-fields.

And at the same plant, a worker died from electrocution after working double shifts for three days. He was standing in water from a leaking drain, and was covered in carbon dust because dust collecting machinery was broken. This same plant had a history of firing employees for striking over health and safety issues.

According to the authors, Union Carbide, whose worldwide sales last year totalled $8.74 billion, has the dubious distinction of being responsible for the world's worst industrial disaster (Bhopal, and the worst industrial disaster and in the US, the Hawk's Nest incident).

But abuse of power is more than a list of horror stories. The book catalogues company cover-ups, underscoring the need to hold multinational corporations accountable for environmental performance.

In the Hawk's Nest incident, the widow of a Union Carbide worker had her husband's body exhumed only to find that the man, buried by the company barely hours after his death, had three other men stacked on top of him.

Partly because of such practices, the authors say the total number of deaths at Hawk's Nest is still not known.

The book says that the pesticide aldicarb, known by its tradename, temik, was being made and sold by Union Carbide long after it was found to cause cancer, and despite hundreds of cases of temik poisoning including some deaths, which were reported across the country after the chemical turned up in drinking water, potatoes, and watermelons.

"But with temik making up as much as 55 per cent of the profits of the company's agricultural division, the potential for harm to people and the environment, it seems, took a back seat at Carbide — not for the first time or the last time", the authors affirmed. Even the company's statements on Bhopal are shown to contradict their own research findings on the deadly MIC, the authors say.

"The gas is non-poisonous", Union Carbide India medical officer, L.D. Loya, is quoted as saying. "There is nothing to do except to ask patients to put a wet towel over their eyes". And J. Mukund, the Bhopal works manager, is quoted as saying that "MIC is only an irritant, it is not fatal".

Research by Carnegie-Mellon University's Mellon Institute found that MIC "appears to be the most toxic member of the isocyanate family....(it) is highly toxic by both the peroral and skin penetration routes and presents a definite hazard to life by inhalation".

To develop corporate accountability, according to the authors, companies should set aside "special funds to assist workers and surrounding communities in the event risky industrial operations are curtailed or shut down.

-- **Financial Express**

BHEL BAGS KPCL ORDER

The electronics division of Bharat Heavy Electricals Ltd. (BHEL), Bangalore has bagged a prestigious order valued at Rs. 4.40 crores from the Karnataka Power Corporation Ltd. (KPCL) for supply of 10 sets of micro-processor based static excitation equipment for Sharavathi hydro power station. According to a company release, the order had been won against stiff global competition from reputed manufacturers from Europe and Japan. These modern static excitation equipment will replace the existing equipment as part of the renovation and modernisation programme at Sharavathi.

POLLUTION CONTROL

Flakt India to expand field

Flakt India Limited, which manufactures the complete range of air pollution control equipment is gearing up operations to enter all areas of environment control. Talking to newsmen at Calcutta on May 4, the company managing director, Mr. A. Mookherjee, said the company was considering an entry into the areas of water pollution control and industrial waste management. Apart from equipment manufacture, the company would also provide consultancy.

Describing the move as synergistic for Flakt India, Mr. Mookherjee said, the company would also stand to gain from its holding company — Flakt AB of Sweden — which is also diversifying into water pollution control and waste management.

While the Swedish company had already taken over Flootecch AB, a small company manufacturing water pollution control equipment, the Swiss company's primary concern is waste management. Mr. Mookherjee said that Flakt AB has plans to expand the operations of both the new companies.

Asked about the demand for such machinery and environmental consultancy work, he said the demand is expected to pick up greatly in the future with the government laying greater stress on environmental control. Referring to waste control, he said the Union government has already set up a national waste control council.

The government is also considering a proposal to introduce compulsory environment audit in this context. Mr. Mookherjee said, Flakt India is negotiating with a number of companies in the US, UK and West Germany for expertise in this area. "We will also apply for authorisation as environment auditors in due course" he added.

As far as environment consultancy work is concerned, the company has already made some progress and has bagged a project from a large public sector undertaking. Asked about other expansion plans, Mr. Mookherjee said the company has started manufacturing large leak-proof isolators and has tied up with STL Refrigerators of Sweden for production of condensers and chillers. The company was also exploring the possibility of manufacturing industrial heat exchanger.

Earlier, at the company's 30th AGM, the chairman, Mr. B.A. Larsson, ruled out the possibility of Flakt AB diluting its 51 per cent stake in the Indian concern. Mr. Larsson was replying to shareholders requests for taking the company out of the FERA net, the chairman said Flakt India was enjoying total access to developments in the Swedish company. While the company improved its performance during 1989, Mr. Larsson regretted that high cost of inputs and delay by public sector units in clearing bills were causing problems.

GAS LEAK IN TISCO PLANT

At least 23 people were taken ill after inhaling poisonous gas leak from a blast furnace of the Tisco workshop at Jamshedpur at on May 3rd. Company's factory inspector R. Prasad said that the gas leak was detected when one of the blast furnaces was being relined. The leaked gas might be carbon monoxide, he said adding that such an incident happened for the first time in Tisco.

Mr. Prasad said, an investigation into the gas leak was on, "generally, the relining is done every four or five years after all the furnaces are shut down", he said. Meanwhile, all the gas victims have been admitted in the Tata main hospital. Except two, the remaining 21 patients, were discharged on May 4 as their condition was stated to be out of danger. The two patients were retained in the intensive care unit, hospital sources said.

WANTED KNOW-HOW

A reputed Chemical Company wants to put up the manufacturing facilities for

1. CHLORO ACETYL CHLORIDE
2. ACETYL CHLORIDE
3. PARA NITRO CHLORO BENZENE
4. 2:4 DI-NITRO CHLORO BENZENE
5. DIETHYL ANILINE

The Company is looking for reputed Consultants/Individuals who can supply the entire Know-How. Interested parties please apply in confidence with entire details to:

Box No. 1236, CHEMICAL WEEKLY

306, Shri Hanuman Industrial Estate, G.D. Ambekar Road, Wadala, Bombay 400 031.

ENERGY EFFICIENCY PROJECTS

UK to provide £50m

The UK has agreed to provide a £50-million new aid for energy efficiency projects in India. This would be in addition to £40 million given last year for forestry projects, the visiting British Overseas Development Minister, Ms. Lynda Chalker, said at New Delhi on May 3.

Addressing a press conference, she said this was one of the largest grants the UK was making this year and "it is very important one". Along with poverty alleviation, energy efficiency is a major priority, she said.

During her four-day stay, she met the President, Mr. R. Venkataraman, Prime Minister Mr. V.P. Singh, the Finance Minster Prof. Madhu Dandavate, the Railway Minister Mr. George Fernandes, the Energy Minister Mr. Arif Mohammed Khan and the Minister of State for Environment and Forests Ms. Maneka Gandhi. She would be meeting the Karnataka Chief Minister at Bangalore on May 4 before leaving India.

Ms. Chalker said her Government was discussing with the Indian Government "as a matter of urgency" a number of suitable projects to be covered by this grant. These include an energy audit of a thermal power station, rehabilitation of hydro-electric plants, energy efficiency measures for industrial users of electricity and assistance with transmission and distribution projects.

Ten million pounds would go towards providing technical assistance. Replying to questions, Ms. Chalker said the UK could consider aiding the Ganga project if concrete proposals are put forward. In this connection, she said her country was considering the Dhaka Delta and projection project.

Ms. Chalker said she had discussed with Mr. Fernandes some railway projects where her country could help. On the progress of the £40 million project for developing alternative strategies through forestry projects as a substitute of chlorofluorocarbons (CFCs), she said the project report is expected within three weeks.

A number of projects are in an advanced stage of preparation. On Super 301, she advised Indian and the US, to discuss the problems of the service sector across the table. She said "that's exactly what the UK had done to resolve some problems in the 12-member European Community. About importing more goods from India, she felt that it has some limitations. The Central and Eastern European markets hold good prospects, and India should explore it, she said.

RAMAGUNDAM UNIT: PLAN TO UTILISE FURNACE OIL

A proposal to use furnace oil in place of coal for generation of power from one of the three 500 mw units at NTPC Ramagundam is under serious consideration of the Andhra Pradesh Govt.

An offer to this effect, in fact, emanated from the Union Power Secretary, Mr. Rajagopal, while participating in a seminarn on power shortage in the souther region at Hyderabad recently. The Power Secretary made the suggestion since the third 500 mw unit was lying idle for want of coal.

Official sources stated that a decision on the matter is likely to be taken soon and it may become possible to use furnace oil along with coal. This could give an additional generation of seven to eight million units of energy per day.

APSEB will be meeting the increased generation costs (by using furnace oil for the energy) it would be consuming from the 500 mw unit. Details of additional expenditure likely on this account are being worked out and a decision taken thereafter.

ZINC OXIDE (WHITE SEAL)
ZINC OXIDE (RUBBER GRADE)
For Export and Local Market Offered at Most Competitive Rates
Contact Manufacturers
ZINCOLOID (INDIA)

Bombay Office:
110, Vardhman Chambers,
17/6, Cawasji Patel Street, Fort,
Bombay - 400 001.
Phones: 2047360/2041175
Telex: 011-3575 AMBE IN

Baroda Office:
103, Synergy House, Taico Estate,
Gorwa Subhanpura Road,
Vadodara 390 007.
Phones: 329211/321583
Telex: 0175-690 RUBA IN

Agents: M/s. JAS ENTERPRISES, Padamsee Annexe, Chakala Street, Bombay 400 003. Phone: 325548.

FOR YOUR REQUIREMENTS OF

ORTHO TOLUIDINE (O.T.)
ORTHO ANISIDINE (O.A.)
ORTHO CHLORO ANILINE (O.C.A.)
META TOLUIDINE (M.T.)
PARA ANISIDINE (P.A.)
ANILINE OIL (A.O.)
PARA TOLUIDINE (P.T.)
2,5 DICHLORO ANILINE (2,5 D.C.A.)
&
SULPHANILIC ACID

Contact Manufacturers

SARNA CHEMICALS P. LTD.

Office:

1-Nirmal, Plot 147, GIDC, Vapi 396 195
Phone: Office: 836; Resi: 1604

Works:

Plot No. 805/3, 3rd Phase, GIDC, Vapi 396 195

ALSO AVAILABLE

SCARLET RC & RED TR

Tapping non-conventional energy sources

Non-conventional energy sources. What are they? Why should they be used? How? Aren't they more expensive? For many, the mention of non-conventional energy sources brings up visions of improved chulhas and solar cookers. Stretch it a bit — biogas plants, wind energy, and biomass. There the tap of knowledge begins to run dry.

Let's take up some of them. Biogas plants, for instance, Biogas is produced from cattle dung. It is a cheap and clean fuel. It saves the trek to collect fire wood and exposure to smoke in the kitchen. And if latrines are attached to these plants, it helps village sanitation too.

The units come in different types and sizes but some factors have to be kept in mind while setting them up. For instance, the groundwater level has to be at least 2 metres below the surface and there must be no well or handpump within 15 metres of it.

What makes the unit financially viable is the cash inflow in terms of saving on firewood and production and use of enriched manure for agriculture. Plus, the financial facilities and Central subsidy provided.

The aim of the improved chulhas is to reduce deforestation, meet cooking energy needs, save fuel, and reduce health hazards while cooking. Thus these chullas mean less time spent gathering wood, less money spent on fuel, less smoke — fewer respiratory problems and less initial cost because of the local construction materials being used. Also, use of local skills would mean more job opportunities.

The improved chulha has three main features: a closed hearth, where combustion of wood takes place, protecting the fire from the vagaries of the wind; multipot design; a chimney to bring in the air needed for combustion and removing smoke. Some 50 lakh of these chulhas, it is estimated, [illegible] to a saving of 42 lakh tonnes of firewood every year.

Or take the solar cooker, which uses solar energy. No smoke, no soot. Saves money and fuel, cooks four times at a time, preserves the nutritional value of the food. Many daily items can be cooked in it; cooking takes 2-2 1/2 hours, depending on the food and the season. Of course, it has to be kept in the open, where it can get enough solar radiation. Cooking takes less time in summer.

Then there is wind energy — another source for pumping and power generation. India, they say, has a potential of more than 20,000 MW for wind power generation and is one of the promising countries for this source. There is also the biomass programme, under which plantation projects have been taken up to fulfil, needs of fuel fodder and power generation.

R & D work is being done on hydrogen energy, ocean energy, and chemical methods. Attempts to develop renewable energy systems for transport needs — for instance, Delhi's battery-powered buses.

A lot is happening then, points out the department of non-conventional energy sources. The department was set up in 1982. While the use of conventional energy sources is expected to go up, renewable sources too, are expected to become increasingly important. For one, they would not run out and that would increase the security of the supply system. Two, if the social, environmental and running costs are taken into account, they are already more economical than conventional alternatives, it is said.

Therefore, the rationale for non-conventional and renewable energy sources is pretty obvious. Thus the community, and family-type biogas plants, solar water-heating systems, driers and cookers, solar photovoltaic pumps, and wind pumps. But how does the department go about dissemination, and implementation? The answer: Central and state governments, nodal agencies, autonomous bodies, housing corporations and voluntary organisations. A trained workforce of self-employed workers has been created at the grassroot level for the chulha programme.

Special areas have been selected —Lakshadweep, and Andaman and Nicobar Islands, a cluster of 21 villages around the Ranthambore forest reserve, parts of the UP hills. And, Urjagram projects which are integrated, village-level energy projects have been started. What of the future? A perspective plan has been prepared for the year 2001. It has been estimated that about 250 million tonnes of coal replacement is possible by the turn of the century, which is about 20 per cent of the projected overall energy demand. What is needed then, it is argued, is capital investment in non-conventional energy sources, — modest compared to that in the conventional energy sectors.

SAIL TO HAVE STAKE IN TML PLANT

SAIL has agreed to have equity participation in the chemical beneficiation plant being set up by the State-owned Tamil Nadu Magnesite Ltd. (TML). The modalities for the proposed participation are being worked out, according to the annual report of TML placed in the Tamil Nadu Assembly on May 5. The plant is slated to start commercial production by January next year.

The company has also sought equity share capital from the State Government for the brick plant so that the second instalment of technical knowhow fee for an Austrian firm could be paid. MECON has been commissioned to prepare the detailed project report based on the date to be transferred by the Austrian firm.

Enforcing energy conservation

The Government is examining the possibility of trying out compressed natural gas (CNG) as an automotive fuel on a commercial scale in a few cities. Officials are toying with the idea of linking the Bombay gas distribution network with supply of CNG through existing petrol pumps.

To begin with, Delhi Electric Supply Undertaking (DESU), which has been given tbe job of providing piped gas to Delhi city is likely to be asked to supply CNG as well on an experimental basis.

It may be recalled that the Oil and Natural Gas Commission has submitted a detailed proposal on commercialising CNG. The scheme costing Rs. 172 crores during the Eighth and Ninth Plans, will usher in an era of dual fuel-powered engines which depending on public response, can be upgraded into fully gas-fired engines on a future date.

It will result in the substitution of 10,525 lakh litres of diesel and 2,900 lakh litres of petrol valued at Rs. 210.50 crores and Rs. 274 crores, respectively, during the period.

Officials are also seized of a host of other proposals aimed at conserving oil and petroleum products. It is increasingly realised that years of persuasive approach has not had the desired impact. The stage has now come for legislative measures which will make conservation mandatory.

The following are some of the suggestions which are under consideration. The first is the constitution of an energy conservation board on the lines of Pollution Control Board wherein standards of energy use across the sectors are set in accordance with the laid down norms and energy use is strictly monitored.

This board will act as a watch dog. Its functions will include monitoring of energy policies and programmes, carrying out of energy audits and their implementation through State/regional boards. These steps will ensure compliance of standards for final energy end use in all sectors for new capacity generation or modernisation programmes.

A related proposal seeks to strengthen the Bureau of Indian Standards (BIS) in energy-related areas by evolving standards for industrial machinery and domestic appliances. Creation of an apex body called 'National Energy Council' with a view to integrating energy supply and demand and develop long-term approach through an integrated energy plan has also been suggested.

National energy policy formulation and its effective implementation will be the thrust area for the proposed council. It will be responsible for taking policy initiatives in terms of energy resource availability, demand and supply patterns, conservation and energy efficiency programmes, long-term planning, taxation and legislation, inter-fuel substitution measures, development of renewable resources energy, pricing, research and development work and training and education.

District energy councils will generate an energy data base, an essential pre-requisite for energy planning exercises at the regional and national levels. It will also conduct education and training programmes at the unit level.

Based on energy end use data generated by the district councils the regional council will identify, compare and compute energy intensities across the sectors, energy price differential amongst various fuels, consumer choices and initiative efficiency programmes in energy-intensive industries.

To promote consevation movement, fiscal incentives in terms of tax rebate and excise reliefs to non-fiscal incentives such as capacity expansion can go a long way to achieve conservation in a desired manner. At least during the early years a regime of rewards and penalties are necessary so that the need for conservation sinks into corporate and social psyche.

The transport sector consumes over 56 per cent of petroleum products. The share of road transportation has been progressively increasing during the past 35 years. If this trend continues, it is possible that India may end up, by the turn of the century, with road transport accounting for 85 per cent of freight movement and 80 per cent of passenger movement, according to projections.

Transport sector is thus the most crucial sector controlling the demand for petroleum products for any meaningful impact on the outflow of foreign exchange on account of petroleum imports. Japan enacted a law as early as 1979 outlining the standards for rational energy use for factories, buildings, home appliances and automobiles. So what is being proposed in this country is nothing new.

TORRENT MAY BAG INSULIN EXPORT ORDER

The Soviet Union will be buying substantial quantities of insulin from India during the current year and an Ahmedabad drug unit is likely to secure the export order.

According to reliable sources, more than one Indian party is bidding for the export contract but Torrent Laboratories is expected to clinch the deal. Torrent is a major exporter of many drugs, particularly to the Soviet Union.

Torrent, the sources said, is likely to have an arrangement with Sarabhai Chemicals of Baroda whose insulin plant has recently gone on stream. Sarabhai has built up a large capacity for insulin manufacture keeping in view the growing requirement of the vital drug in India. But presently not all the installed capacity is being utilised.

HZL plans to invest Rs. 1,000 crores

Hindustan Zinc Limited (HZL) plans to invest nearly Rs. 1,000 crores on various projects including a Rs. 250-crore fertiliser plant, during the Eighth Plan.

The public sector company's managing director, Mr. A.C. Wadhawan, told reporters on May 2 that an integrated project is to be completed by May next year comprising the Rampura-Agucha mining complex and Chanderiya lead-zinc smelter, which will have a capacity of 70,000 tonnes of zinc and 35,000 tonnes of lead per annum.

With the commissioning of this project, Mr. Wadhawan said, HZL's production capacity of these metals will be almost doubled and the turnover of the company will rise to around Rs. 1,000 crores. To finance this project, the company has already issued bonds for Rs. 80 crores during 1989-90 and bonds worth another Rs. 220 crores will be issued in the current financial year.

The company also proposes to recover sulphur, silver and iron from pyrites, now being treated as waste. A sulphuric acid plant will be used as a raw material base for the fertiliser plant in Rajasthan.

Mr. Wadhawan said the the Rajasthan government will provide rock phosphate for the plant and the other raw material, ammonia, will be purchased by HZL from the market.

HZL also has plans to diversify into other metals. The company which is now a prime producer of zinc, lead, silver and cadmium in the country will become a multi-metal organisation, Mr. Wadhawan said.

During the Eighth Plan, the managing director said, HZL will enter the field of other strategic metals such as cobalt, tungsten, nickel, chromium and tin.

The company is in the process of taking over the tungsten mine at Degana — the only operating tungsten mine in the country — from the government of Rajasthan, and expanding the mining capacity to meet defence requirements, he said.

Another fertiliser in the company's cap the managing director said, was that it has been appointed as the lead company for increasing the recovery of diamonds from the present mines and exploring the possibility of augmenting diamond production at various places. Mr. Wadhawan also informed reporters that HZL achieved several all time records during the year ended March.

The company's pre-tax profit shot up to Rs. 85.10 crores, 145 per cent more than last year. Output from the company's mines rose by 8 per cent to 1,79,350 million tonnes of lead-zinc concentrates and the production of lead and zinc increased by 14 per cent to a new high of 88,023 tonnes. Record outputs were also recorded for cadmium, 261.11 tonnes and sulphuric acid, 1,15,969 tonnes.

CENTURY TO SET UP SPONGE IRON UNIT

Century Textiles and Industries Ltd. is diversifying into steel. The company proposes to set up a 1.5 lakh tonne capacity coal-based sponge iron project in Madhya Pradesh. The Rs. 80-crore project has now gone to the Cabinet Committee for Economic affairs for approval. The site has been identified and Madhya Pradesh Government has already approved the project, the Century Chairman Mr. B.K. Birla said on May 2.

Century is also awaiting final clearance for the Rs. 700-crore 450 mw (two units of 225 mw each) thermal power project in Rajasthan. Century had signed a memorandum of understanding with Rajasthan Government two years ago, but the project has got stuck with the Union Government.

Mr. Birla said the group will give priority to the power plant project over the petrochemical project, another ambitious Rs. 400-crore project pending with the Government. He confirmed that Century has not been allotted a letter of intent for the petrochemical project (for synthetic rubbers and motor fuel additives) for which there were other claimants. The project which is to come up in Maharashtra was earlier coveted by Bennet Coleman and Company Ltd. and the Chief Minister, Mr. Sharad Pawar, had canvassed for the publishing company. However, Mr. Pawar now supported Century's candidature.

Century Enka, a group company, is expanding its polyester filament yarn capacity at Mahad by 15,000 tonnes. Birla group companies are also promoting a new grassroot PFY plant in Gujarat styled Rajashri Polyphils together costing Rs. 235 crores. The Mahad expansion will come on stream by mid-1992 and the Gujarat plant by 1992 end, Mr. Birla said. The group has also sought a letter of intent to setup a Rs. 40-crore 100 tonnes-per-day carbon disulphide project in Gujarat.

Century proposes to spend approximately Rs. 150 crores every year for the next three years on plant modernisation and capacity expansion of existing plants. The company spent about Rs. 27 crores on revamping its ageing cement plants during the 15 months which closed in March. All its cement plants are based on dry process, some of them as old as 17 years.

Improvements in technology enabled the group to bring down power consumption of its cement plants by 15 units per tonne during the last two years. A Rs. 35-crore expenditure is proposed for Century's textile division alone for the coming two years. The company stands foremost in exports among all corporate giants. Century Textile's exports touched Rs. 85 crores last year.

India's Multinational and Leading Consumers prefer only KGI's Gum
The top quality products
For Your Regular Requirements of:

Gum Accacia
(Powder & Crystal)

Guar Gum
(Pharma & All Other Grades)

Gum Tragacanth
(BPC Standard)

Gum Arabic * Clove Oil

WE CAN SUPPLY AS PER NEW I.P. 1985
WITH MICROBIOLOGICAL TEST

Please Contact:

Together We Progress

KAPADIA GUMCHEM INDUSTRIES

G.P.O. Box No. 1160, 3 Mint Road, 2nd Floor, Opp. G.P.O., BOMBAY 400 001.
Phones: 2611087/2615073/2617217 Resi.: 6205517/6207028 Gram: PHARMAGUM
Fax No.: 91-22-2612659 Attn.: Mr. RAMESH KAPADIA

FOR YOUR REGULAR REQUIREMENTS OF:

ETHYLENE DICHLORIDE (E.D.C.)

AVAILABLE
IN TANKERS AND IN DRUMS

CONTACT MANUFACTURERS

ANANT & COMPANY

BOMBAY	:	72, PODAR CHAMBERS, S.A. BRELVI ROAD, BOMBAY 400 001. **Phone: 2860404 / 2861452 :: FAX: 2860432 :: Telex: 011-2116/ 5100 ART IN :: Gram: ARTHA**
AHMEDABAD	:	38, PRITAM NAGAR, ELLIS BRIDGE, AHMEDABAD 380 086. **Phone: 79089**
BANGALORE	:	FLAT NO. 311, CHITRAMALA APTS., 4TH CROSS, BYRA SANDRA, BANGALORE 560 011. :: **Phone: 609871.**
CALCUTTA	:	13/3, CHOWRINGHEE TERRACE, CALCUTTA 700 020. :: **Phone: 280415**
DELHI	:	C-13, GUJARANWALA APARTMENTS, J-BLCOK (OPP. ANAND KUNJ), VIKASPURI, NEW DELHI 110 018. :: **Phone: 539458**

Available from Ready Stock at Competitive Rates

ISOPROPYL BROMIDE
ISOPROPYL ALCOHOL
ISOBUTANOL
LIQUOR AMMONIA 910-888
METHYL ETHYL KETONE
METHYL ISOBUTYL KETONE
METHANOL R.C.F.
METHYL DICHLOROACETATE
MONOETHANOLAMINE
METHYLENE DICHLORIDE
NITROBENZENE
N-PROPANOL
OLEIC ACID PURE/TECH.
ORTHO DICHLOROBENZENE
PERCHLORO ETHYLENE
PHENOL CRYSTAL/LIQUID
PYRIDINE PURE
PINE OIL COMM.
PEG 200/400
SORBITOL
SOYALECITHIN
1-1-1 TRICHLOROETHANE
TRICHLORO ETHYLENE
TOLUENE
XYLENE
TRIETHYLAMINE
TETRACHLOROETHANE
TRIETHANOLAMINE
TRICHLOROETHYLENE (SUBSTITUTE)

Please Contact:

MAKS CHEM INDUSTRIES

89, Princess Street, Pirbhoy Mansion, 2nd Floor, Bombay 400 002.
Phones: Office: 312358/257898/254363 Resi.: 8115229/8227223/6126969 Gram: "MAKSOL"
WE BUY CHEMICAL WASTE & DISTILLED SOLVENTS REGULARLY. WE REQUIRE CRUDE SOLVENTS LIKE IPA * CHLOROFORM * C.T.C. * TEA * METHANOL * ACETONE * PHENOL
Factory: Plot No. 1322, G.I.D.C., Opp. Hitech Capsule Factory, Sarigam, Dist. Valsad (Gujarat).

For Better Quality &
Reliable Services

ROSALINE®

GAYATRI GUM INDUSTRIES
OFFICE : 4, Hiral Shopping Centre Bhattha, Paldi,
Post Box No. 12019 AHMEDABAD-380 007 (INDIA)
Telc. : (O) 418776 (R) 414751 GRAM : ROSALINE

EVERYTHING IN GUAR GUMS
PRINTING GUMS
SIZING GUMS
CMC GUMS

Available from Ready Stock

Hydrofluoric Acid 40-50-60%

Distributor of

M/s. GUJARAT FLUOROCHEMICALS LTD.

Contact:

M/s. UNION ACID & ALKALI P. LTD.

151-B, Mittal Court, Nariman Point,
Bombay 400 021
Tel.: 223222/231455/244075 * Telex: 011-5290 UNIN-IN

Highlights in Chemical Technology (Part 2)

A NEW PROCESS TO SYNTHESISE POLYGLYCOLIDE FROM CARBON MONOXIDE AND FORMALDEHYDE

The Japanese National Chemical Laboratory for Industry has recently unveiled a novel catalytic synthesis for biodegradable polyglycolide in a one step process. In this new process, formaldehyde and an excess of carbon monoxide are reacted in the presence of an acid catalyst. In this catalytic polymerisation reaction, the two reactants are linked in alternation to give polyglycolide in nearly 100% yield. The reaction is a high pressure (100-200 atm.) reaction at 150-170°C temperature.

Polyglycolide is a polymer of glycolic acid. It is readily hydrolysed into glycolic acid which is readily decomposed by microorganisms into carbon dioxide and water. The conventional synthesis of polyglycolide is from glycolic acid. This synthesis requires a multi-step reaction process covering (a) synthesis of glycolic acid, (b) synthesis of a cyclic glycolic dimer, (c) synthesis of polyglycolide by a ring opening polymerisation reaction. Each of the above steps requires strictly controlled reaction conditions.

A NEW PROCESS FOR MAKING FLEXIBLE POLYMETHANE FOAMS WITHOUT CFCs

Union Carbide (USA) has introduced in 1989 the first system for making all types of flexible polyurethane foam that requires no chlorofluorocarbon (CFC) blowing agent.

Flexible polyurethane foam manufacture accounts for almost 5% of CFC emissions in USA — that is about 25 million lb annually. The foams are used in mattresses and cushions for furniture and automobiles. The current technology employs CFCs or a combination of CFCs and methylene chloride to soften the foam, reduce its density and cool it during production.

Carbide reports that its new technology employs proprietary polymer modifiers called 'Geolite' to the usual mix of polyols, surfactants, catalysts and diisocyanates. The resulting foams are reported to perform as well as conventionally made foams. The new process, if successful could reduce emissions of ozone-destroying CFCs into the atmosphere.

Carbide intends to license its technology to foam producers worldwide. The new chemical technology will require no change in production equipments and will cost about the same as current CFC-based system. (*C & EN*, 9/25/89, p. 8).

MICROWAVES HARNESSED TO PRODUCE BETTER DIAMOND POWDER

Researchers have successfully manufactured diamond powder that is cleaner and more uniformly sized than the commercially available material. This breakthrough will enable better understanding of the structure of diamond crystals and may lead towards developing new materials.

The new process developed at Pennsylvania State University and Diamond Materials of State College, Pennsylvania, involves burning a carbon compound such as dichloromethane in a microwave plasma. The reaction produces powdery diamond crystals of several different types, including the cubic structure seen in natural diamonds.

This is the first time in USA that diamond powder has been made by homogenous nucleation directly from the gas phase, reports Karl Spear, a group leader of the Penn State research effort.

The microwave method avoids the formation of soot and non-crystalline materials, perhaps because both oxygen and atomic hydrogen are present in the plasma. So far the researchers have made only milligram quantities of diamond powder, but they hope to scale up the process. The resulting product would be useful for polishing high-precision mirrors and making diamond ceramics. Diamond Materials is keen on commercialising the process. (*C & EN*, 7/17/89, p. 24).

A NEW FAMILY OF HIGHLY STABLE HYDROGENATION Ni CATALYSTS DEVELOPED BY CROSSFIELD CHEMICALS (UK)

A new generation of highly stable hydrogenation catalysts with improved activity, and a nickel content well below that of alternative products has been unveiled in 1989 by Crossfield Chemicals of UK, part of the Unilever group of companies.

Trade named HTC, the catalysts' applications include reduction of the aromatic component of solvent and white oils and hydrogenation of pyrolysis gasoline, resins and waxes.

The catalysts consist of small nickel crystallites with a specific nickel surface area greater than 150 sq. mt./gm. of nickel deposited on a porous support medium. Pore size of the support can be varied depending on the intended use resulting in reduced diffusion limitation within the catalyst. Designed for use in fixed-bed reactor processes, the HTC catalysts were developed jointly by scientists at Crossfield and Unilever's research centre in the Netherlands. (*C & EN*, 7/17/89, p. 24).

AUTOMATED CHEMISTRY LABORATORY EMPLOYING ROBOTS ON THE HORIZON

Scientists at the National Institute

of Standards & Technology (NIST) are developing a generic automated chemistry laboratory that would use robots to do routine chemical analysis.

NIST is trying to set up a consortium on Automated Analytical Laboratory Systems, pooling the resources of experts from universities, government and industries. Researchers at NIST have already developed a part of this process — a robotic structure that automates the separation steps for chemical analysis.

Plans call for any automated system to be very flexible with interchangeable parts and software interfaces. They also require built in quality assurance steps to ensure results that are reproducible. By setting up a consortium for the development of the automated lab, NIST hopes to get suggestions from all potential users of such a system, especially those that cannot afford to handle projects like this alone. (*C & EN*, 9/4/89, p. 13).

ISOTOPE ENRICHMENT OF ORGANICS REPORTED

Direct enrichment of nitrogen and oxygen isotope in dissociable compounds such as amines, phenols and carboxylic acids is now possible using high performance liquid chromatography (HPLC), according to Kyoto Institute of Technology, Japan, researchers.

Isotopic enrichment of organic compounds in the stable minor isotopes ^{15}N, ^{17}O, ^{18}O, which are often used as tracers, is commonly achieved by synthetic routes involving isotopically enriched precursors such as NH_3, H_2O, and CO_2. However, such labeled compounds are not always commercially available or easily synthesised.

Now a new route has been opened using a reversed phase HPLC, based on variations in the extent of ionisation of weak acids and bases containing different isotopes of nitrogen and oxygen in the protonation/deprotonation position, resulting in different chromatographic retention.

The researchers report enrichment of ^{15}N in N,N-dimethyl aniline from a natural abundance of 0.37% to an isotopic purity of 5 to 10% in less than 14 hours, subsequent runs brought the isotopic purity to 90% or more. Enrichment of ^{17}O and ^{15}O to similar purities in p-nitrophenol was also achieved. (*Nature*, **341**, 727, (1989)).

DEGUSSA (W. GERMANY) DEVELOPS SODIUM PURIFICATION METHOD FOR DETOXIFICATION OF USED OILS

Used oils have been a great hazard as they contain PCBs, for which the only disposal method has been high temperature incineration, the new sodium purification method from Degussa.

Degussa process is easy to control and converts the chlorine containing compounds, such as dioxin and polychlorinated biphenyls (PCBs) into harmless sodium chloride and non-toxic polymers. The first plant based on Degussa process was established in France. It reprocesses industrial oils containing chlorine into non-toxic reusable products.

POLYPROPYLENE SUGGESTED AS KEY INDEX OF INDUSTRIAL ECONOMY

Since the beginning of this century, sales of metals (e.g. copper and steel) have served as useful economic indicators. With the use of chemical technology in the early 1930s, sulphuric acid also became a useful indicator of a nation's industrial activity.

With the ushering in of the 'age of polymers', it is not surprising that now polypropylene is emerging as a key indicator of the economic climate of the major industrialised countries

A report titled 'Understanding the Economy Through Plastics: Propylene' authored by Italy's Ferrizzi group, in the European Chemical News Sept. 19th, 1988, shows the relationship between sales of polypropylene and the general index of industrial production in Britain, West Germany, Italy and the USA. (*Chem. Tech.*, 10/1989, p. 1BC).

CHEMOSELECTIVITY OF AN ORGANIC REACTION ON A SOLID ADSORBENT

A rare example of chemoselectivity of an organic reaction in solid adsorbents was recently demonstrated by H. Ogawa and coworkers. When a mixture of C_{12} and C_5 straight chain dibasic acids was esterified with diazo-methane on an alumina surface, the C_{12} acid was preferentially monoesterified (89% vs 5%), the larger the difference in the number of carbon atoms, the higher the selectivity. The reagent also recognises monocarboxylic acids. (*Bull. Chem. Soc.*, Japan, 1988, **61**, 2383). (*Chemtech.*, 12/1989, p. 746).

PLASTIC MAGNETS AT LOW TEMPERATURE DEVELOPED

A Japanese laboratory has produced a plastic that exhibits magnetic properties at low temperatures. This breakthrough could greatly affect technologies such as magnetic sensors. Previous attempts to make magnetic plastics could not produce a uniform material of consistent quality, but the group at Hokkaido University (Japan) is using a process that avoids many of these difficulties.

The team led by Masaaki, made the magnetic material by dissolving a derivative of acetylene in ethanol and reacting it in the presence of rhodium catalyst for 24 hours. A yellow precipitate was produced which when heated to 200°C, transformed into a plastic material of uniform characteristic. The material is non-magnetic at room temperature, at -180°C it shows magnetic properties.

This is just above the temperature of liquid nitrogen.

Many companies including IBM and Du Pont are working on magnetic plastics, but the processes developed so far have been unreliable. The reason for their interest in the plastics is that they can be pressed into very thin films to make new types of magnetic sensors. Other applications for example, replacing metal magnets in loud speakers, are also attracting interest but these will need much more development work. (*New Sc.*, 1/20/90, p. 36).

IPCL (BARODA) ENTERS INTO THE FIELD OF ENGINEERING PLASTICS WITH FOREIGN COLLABORATION

IPCL (Baroda), Gujarat has made a debut into the virgin field of engineering polymers by entering into a joint venture with GE Plastics of Europe for developing market for engineering polymers. The joint venture is under the name of GE Plastics (India) Ltd. and will manufacture engineering plastics in future after extensive market study.

The new venture will first establish a new application development centre for engineering plastics in New Delhi, for product development and technical service to engineering industries. Initially, the joint venture will concentrate on markeing Lexan polycarbonate resin and Nory modified polyphenylene oxide resin and various alloys and blends of GE Plastics (Europe) in India as well as study their market in both India and West Asia.

ZEOLITE PROVIDES INDIVIDUAL MOLECULAR WIRES FOR FUTURE ADVANCED COMPUTERS

Sophisticated advanced computers of the future could be built without silicon chips, using instead electronic circuits where the components will be individual molecules. Researchers at the University of New Mexico are designing 'molecular wires' using crystals called zeolites that have a honeycomb like structure.

Researchers Thomas and Patricia Enzel have made chains of electrically conducting polymers encapsulated in the minute channels of the zeolites. They reported their findings at the International Chemical Congress of Pacific Basin Societies held in December 1989 in Honolulu, Hawaii.

Polymers, such as polypyrrole, polyaniline and polythiophene can pass an electrical current along the lengths of their chains, but it is difficult to prepare these molecules in definite directions. Instead, conducting plastics tend to form unmanageable tangles.

One way of determining the direction of the growing chain, report Bern and Enzel, is to make the polymer inside the crystallising matrix of a zeolite, such as zeolite Y or mordenite. These alumino silicate minerals have a three dimensional structure consisting of well defined pores and channels.

Zeolites selectively absorb some molecules and ions of the appropriate size and shape while excluding others that are of the wrong shape or are too big. This makes them useful to the chemicals industry as catalysts and absorbents.

To prepare the polymers, the researchers first introduced iron or copper ions into the zeolite. Researchers soaked it in a vapour or solution of pyrrole, thiophene or aniline. The metal ions within the zeolite cause these monomers to react to form a polymer, forming a three dimensional network of chains whose configuration depends on the geometry of zeolite crystal.

As polymerisation proceeds, the colour of the zeolite gradually changes from white to dark blue green. Normally, conducting polymers tend to form a black sticky mass.

Theoretically, the smallest electronic components can be about a tenth of a micrometre across. Making wires on three dimensions at the molecular level could shrink circuits down to thousandths of a micrometre (a few nanometers) in size. Researchers could also develop such minute circuits with the more complicated connections needed for advanced computers. (*New Sc.*, 1/20/90, p. 32).

AN ENGINEERING TEST CENTRE TO EVALUATE PROCESS INSTRUMENTATION & EQUIPMENT ESTABLISHED IN USA

Testing the performance of equipment before buying is a luxury that few companies can afford. The personnel and equipment required would be costly and the lead time required for testing would delay installation. Not testing the products also has its drawbacks — the machines purchased may not be the best in their class, the devices may not meet specifications, or faulty equipment could result in accidents.

Du Pont Co. in view of its ample resource has been testing process control equipment for decades and now the firm has decided to share its test results — for a price. Called the Du Pont Performance Reports, the product comparisons available as annual subscription service or as individual reports — to other companies in or the details of the continuing efforts of the Du Pont Engineering Test Centre (Newark. Del), in evaluating the actual performance of process control instrumentation.

Du Pont began and is continuing its test programme in an effort to determine which instrument and manual valves best meet its own needs. Manufacturers claims can be often confusing, and so it is hard to know whether the equipment will do the job. If the company did not have all the data and

test information to help make an informed buying decision, it would cost a lot of money. Based on that philosophy, Du Pont esablished the Engineering Test Centre to evaluate process instrumentation and manual valves and provide the performance data to all its plants worldwide. Other companies learning of the programme, often asked if they could buy the data. Now they can and the centre can generate revenues, thus enhancing its economic justification.

The test programme and the reports cover manual valves, fittings, transmitters, in-line analysers and other types of commercially available process control equipment. Although the reports list the performance of equipment by brand name, the company is quick to point out that the reports are not product endorsements. The company tests the products the way a user would and publish the test descriptions and results. It does not recommend which equipment you should buy. It provides the information and lets you apply it as required for your own needs. Relevant manufacturer's literature is also included in each report to help complete the information package.

The performance reports are not always benign, however, for example, past reports indicated that 30% of the commercial brands of valves tested in corrosive service failed prematurely, 20% of the flow metres tested did not meet their own manufacturer's specifications and 30% of the digital multimeters tested contained critical electrical deficiencies.

Another recent report noted that of five ball valves designed for use in 65% nitric acid at 200°F, only two still had zero leakage after being subjected to 1500 hours and 15000 cycles in that service. Two of the others failed during the test and the third had to be repacked before it could even begin the test.

Du Pont Co. tests only equipment from leading high quality vendors who meet Du Pont's initial quality screening procedures. The company asks them to loan them the equipment for testing. Many cooperate. In return, the vendors get to see the results of the tests and provide their comments in the final report. As a result of the user-oriented tests, many vendors have modified or even changed their product line. So to some extent, the Du Pont programme provides R & D services for a large portion of instrumentation manufacturers.

A similar service in India will be welcome by chemical process industries in India, but it will require cooperation and ethics both of which are rare in India at present. (*Chem. Eng.*, 1/1990, pp 37-39).

We guard your Valuable Property...
... by strong walls of protection.
JYOTI
Industries
(drum division)
Manufacturers of blow moulded H.D.P.E.
containers upto 100 litres.
JERRY CANS, CARBOYS, DRUMS
OFFICE: 34, Unique Industrial Estate (New), R.P. Road,
Opp. Jawahar Cinema, Mulund (W), Bombay-400 080.
Phone: 561 57 68, 560 29 68
WORKS: Poona – Bombay Road, Opp. Amrut Nagar, MUMBRA-400 612 (THANE)

Now Available Regularly

BEST QUALITY

ORTHO DIANISIDINE BASE

(Fast Blue B Base)

Export Enquiries Are Solicited

CONTACT:

P. G. Chemicals Pvt. Ltd.

166, Nagdevi Street, Ismail Manzil, 1st Floor, Bombay 400 003
Phones: 322303*342754

OCTOATE * NAPHTHENATE DRIERS
LIQUID PVC STABILIZERS

More than 15 years of production and supply experience to customers satisfaction all over India R & D Department always available to supply products tailor-made for the customer. Prompt delivery as per customers schedule.

Please Contact

aryavart

ALSO AT

MADRAS	: Kalar Chemicals, Ph. 426074
NAGPUR	: Panchsheel Textile Traders, Ph. 32667
DELHI	: A.K. DUTT & CO. Ph. 738051
CALCUTTA	: S. Mitra, Ph. 377028

Aryavart Chemicals Pvt. Ltd.

Post Box No. 33,
317 & 319 Arenja Corner, Plot No. 71,
Sector No. 17, D.B.C. Vashi,
New Bombay 400 705.
Tel.: (0215) 670384
Gram: CHEMSFIELD, Vashi, New Bombay 400 703

FOR YOUR REQUIREMENTS OF STANDARD QUALITY

SULPHUR BLACK Extra Grain
SULPHUR BLACK Liquid

Shortly Offering — **ACRYLAMIDE (Liquid) — Indigenous**

Please Contact:

SHREE MADHU HANS IMPEX PVT. LTD.

111, Bharat Chambers, 52-C, Baroda Street, Bombay 400 009.
Phones: 869692/8516312 Telex: 011-76688 SAI-IN

Also Contact for competitive CIF prices of:

PAPER PULP (INDONESIA) * GUM ROSIN (W/W & N)
MEG * TEG * DEG * RAYON FIBRE/RAYON FILAMENT YARN (TAIWAN)

V.V.Trans Investments Private Limited

ANNOUCEMENT

EXCELLENCE THROUGH QUALITY

V. V. TRANS Investments Private Limited

ANNOUNCES WITH PRIDE THE COMMISSIONING OF THEIR PLANT FOR THE MANUFACTURE OF

CHLORINATED PARAFFIN WAX

(HNP / WAX BASED - DIFFERENT GRADE)

FOR YOUR REQUIREMENTS DEALERS/ACTUAL USERS PLEASE CONTACT

M/s. V.V. TRANS INVESTMENT PRIVATE LIMITED

R.O. 43/262, New Sankalbagh
Narasinga Rao Pet,
Kurnool -- (A.P.)
Telephone: 21381
Telex: 0815-216

For Your Requirement of
The Most Powerful Bleaching Agent:

SODIUM CHLORITE

50%, 80% Flakes/ 23% Liquid
Used For Bleaching of:
Paper Pulp, Cellulose, Textiles, Synthetic Yarn,
Oils, Waxes, Guar Gum etc.
Manufactured by:

Zed Chem Pvt. Ltd.

Office: Jaydip, 67 Chaitanyanagar,
Near Sardar Patel Stadium,
Ahmedabad 380 014.
Tel.: 401423

Bombay Office: **Eastern Industries**
Kasturchand Mill Estate,
Dadar (West) Bombay 400 028.
Tel.: 4221568/4304485

For Your Ready Requirements Of:

POLYETHYLENE WAX OF LOW DENSITY (HYDROCARBON WAX)
EMULSIFIABLE WAXES * PIGMENTS FOR PVC CABLE & PE CABLE
OTHER WAX * STEARIC ACID (ALL GRADES), GLYCERINE CP/IW * PVC STABILISERS
TBLS * DBLS * LEAD STEARATE
DBL PHOSPHATE * DBL PHTHALATE
CALCIUM STEARATE * ZINC STEARATE
OTHER METALLIC STEARATES

SPECIALITY IN PVC CABLES, RIGID PIPE AND TEXTILE AUXILIARIES

Please Contact:
Mr. PARIMAL MEHTA

ARPEE ENTERPRISES

296/32, Samuel Street, 2nd Floor, Bombay 400 003
Phones: 320136/328127

MATERIALS MANAGEMENT

Part XIII - Value Analysis

N.R. PAI

Introduction

Originally this technique was introduced in engineering field, wherefrom it was given the name value engineering. However, subsequently it was revealed that the technique can be applied in various other fields like marketing, purchases and even office work. With this broad based application of the technique a more general and appropriate term was coined namely: Value Analysis.

Value analysis technique has two aspects: (i) To undertake a systematic study of a product, of a function or of a service and to find out unnecessary costs that have creeped in it and (ii) To effectively remove these costs without impairing utility of the product or of its function.

Thus the first step in this technique is to find out the unnecessary costs. The most noteworthy part is that these unneeded costs get into the product, function or service in a subtle manner without any one noticing them. They just creep in as such. It is the analytical mind of an experienced value analyst which can pin point them. These costs are incurred without doing any good to the product nor to its function. They neither improve life span, nor quality, nor appearance, nor efficiency, nor safety factor of the product.

In the second step these costs after being discovered are systematically eliminated. The result is the product or function or service costs much lower without bringing down its effectiveness or efficiency.

This is mainly achieved by resorting to less costly materials of construction, cheaper models, and adopting recent most and highly efficient processes of manufacture. The result is the final product so obtained has equally good quality has the same or better performance and utility standards, and all this at a much lower cost. The selling price is thereby lowered. The technique is therefore very effective in augmenting sales and hence the profits of an organisation.

Value analysis thus pin points unnecessary costs, removes them to get a product, function or service of acceptable performance at a much lower cost. It therefore has high savings potential, since money saved is money earned.

None, normally any company operates at "the after tax income" of 10% of the sales value. This means that every Rs. 1000 saved is same as every Rs. 10,000 sales achieved. It is obvious that it is much easier to save Rs. 1,000 than to increase sales by Rs. 10,000. So, the slight alterations in raw material cost has a great leverage on the company's profit margin. And this is exactly where value analysis steps in.

What is value?

In a nutshell value is given as:

$$\text{Value} = \frac{\text{Function}}{\text{Cost}} \qquad \text{(i)}$$

or

$$\text{Value} = \frac{\text{Worth}}{\text{Price}} \qquad \text{(ii)}$$

Value can also be looked upon as the minimum cost that can carry out a given function or service reliably. Whenever a manufacturer feels that the same function can be carried out with an item of lower cost, then it is quite clear that there is a sufficient scope to augment its value or value can be built in it. As a corollary to the above statement it follows that value analysis is a means by which value of an item can be stepped up or in other words value can be built in the item under study.

Again, value can be looked upon as the effective mingling of efficiency, cost and function of an item which leads to the entire containment, cost-wise and function-wise, of the ultimate consumer.

Value analysis analyses the practical utility of methods, processes and products which finally culminates in offering greatest value for the money paid by the consumer. Better value can be had by improving upon the function at the same cost or by maintaining the same function at lower cost. However, the stress is not entirely on cost (i.e. getting an item at the least cost) but the emphasis is on value i.e. on obtaining the utmost for the price one pays. The final aim in mind is to carry out a function in a better way and/or at a cheaper cost.

Different components of value

Value has several aspects. Value arises out of end-use of an item. This is the most important aspect of value, since unless the item has the predetermined end-use nobody would purchase it. Next comes the esteem value. This confers beauty and attractiveness on an item. Even if an item is useful it should be attractive to look at to make it easily saleable. Examples cited are fashionable and stylish cabinets of TV and wireless sets; shapes, designs and styles of modern sleek cars, fashionable and beautiful dials of watches, so on and so forth.

Normally, these are the two important components of value which the manufacturer has to think of before introducing his product in the market. Resale value forms one more component of value. However, it is generally not considered in regular consumer items and is of importance in such cases as of land buying, gold purchases etc. where purchaser can think of inventory profits.

Questioning technique

The most important aspect of applying value analysis technique lies in asking questions to oneself and then in trying to get appropriate answers to each of the querries. The questions are simple that way. But answers to them can bring out several important facts especially in the hands of an experienced value analyst, which can either improve the item or reduce its cost or perhaps both.

Some of the usual questions that are put to oneself include:

1. The basic question: Which item is being considered for value analysis
2. Which function it serves?
3. How much the item costs?
4. Any alternative cheaper design which will carry out the same function reliably or perhaps in a better manner?
5. What will be its production cost?
6. Can the item be simplified further?
7. Can its material of construction be changed to a cheaper one?
8. Are all its components essential?
9. Is the method used in its manufacture economical? or can that be improved worth-wise or cost-wise by recent most production processes?
10. With slight increase in cost can it serve any other useful function so that its overall value is raised?
11. These and many more questions seeking for improvement of item will arise in one's mind when one is actually engrossed in value analysis study.

The questioning technique generally unveils the areas of improvement which can be achieved by way of substitution, simplification, integration, elimination etc.

Some applications of value analysis

To bring out the usefulness of the technique let us consider some of its successful applications:

i) In the Indian automobile industry, frames for the windshield glasses were formerly constructed out of imported rolled steel. Later on it was found that indigenously manufactured aluminium strips could be used instead. Introduction of this idea brought about lot of savings for the manufacturer as well as savings in terms of foreign exchange for the nation as such.

ii) Starch is much used in textile industry as a sizing material for textiles. In India it was formerly made out of maize corn (or other food grains) and was sold as maize starch. Later it was discovered that the tamarind seeds which is otherwise a waste product, can serve as an alternative and as a very cheap source of starch. This move not only brought down the price of starch employed in industry but it was of an immense value in preserving scarce food grains in our country.

iii) In our country formerly cement was checked for its performance with a special type of sand that was imported from Britain. It was called Buzzard sand and its price was around Rs. 1,100 per ton. Later similar type of sand was located near Madras. Since it met with the required specifications it could be included in ISI. It is now employed in the place of the former imported stuff and costs around Rs. 320 per ton. A tremendous saving in terms of cost and in terms of foreign exchange too.

From the above examples it is quite clear that the value analysis technique can be employed to bring down the cost and to preserve material that runs in short supply. It is even useful in case where import substitution is sought after to save upon foreign exchange.

Broad-based applications of value analysis

Value analysis is a technique that can be applied to any item. The analysis expert aims at improving performance and at lowering cost by studying quality-price analysis design-process analysis and lastly the market-supplier analysis.

The first of these three points, aims at reducing the price of an item to a minimum chiefly by employing materials of the minimum quality requirements which can perform the task without any impairment in function whatsoever. Very often it is seen that higher quality material is needlessly employed where cheaper substitute can easily do the same job equally efficiently. This naturally brings down the overall cost of an item. The manufacturer can then fix lower price for its sales and thereby capture the market or oust the competitor.

In design-process analysis an item is checked for adequacy of design for the function it is supposed to perform. Secondly, here it is thoroughly scrutinised whether cheaper methods of manufacture can be employed by resorting to the latest techniques of production.

The quality-price analysis and design-process analysis involve systematic step-by-step approach wherein all the aspects of design of an item against its function are studied very carefully and meticulously. The points that are looked into are: whether raw material of needlessly higher quality

is employed, whether component parts and raw materials ordered are of non-standard sizes, shapes and designs which are difficult to procure and are therefore costly also; whether, while indenting components and raw materials unnecessarily rigid tolerances are specified, which are not at all justified from the point of view of raising the cost of an item. Further the above mentioned two approaches seek to rule out inefficient and outdated processes of manufacture which raise the costs needlessly.

The value analysis technique first establishes the basic functions which the item must perform effectively. The analyst looks into different possible alternatives, different raw materials, equipments, machines, tools, supplies and methods of manufacture which can produce the same function but at a cheaper price. Any unnecessary hidden cost in any of these areas is brought to limelight in this approach and is then systematically eliminated.

Generally the technique is of immense help where prices of items appear excessively high and not in accordance with the functions they are supposed to serve. Items with prices disproportionate to their functions are the prime targets of attack. Since the chances of lowering the costs of production is highest in these cases.

Market-supplier analysis may indicate towards raw materials substitute or towards product with renewed or totally innovated design. Even methods of packing can be taken up for study by the value analyst. Value analysis can bring about substantial savings here too.

Examples that can be cited in the support of the above statement are:

1) Originally medicinal tablets and capsules were sold in glass bottles where bottles plus cartons were used as packing material. Then came metal foils as packaging material to bring down the packaging cost. Further metal foils were replaced by special paper or plastic material to reduce the packaging cost still further.

2) As packaging material at many places glass bottles are replaced by high density plastic bottles which are unbreakable when dropped. This change also reduces the risk of containers getting damaged in transit and also reduces cost on usage of foam and other extra material that has to be otherwise used in packaging.

3) Since metal cost is going up fast; tin containers for edible oils are replaced by polythene ones profitably.

Materials man plays major role in value analysis study

In analysing the market-supplier we have the purchasing aspect also. It must be remembered that the final cost reduction and saving is actually effected at the purchasing stage. Hence often we find value analysis team led by a senior personnel from purchase department or the materials manager himself. The reasons are quite obvious. They can be put in a nutshell as follows:

Materials manager is generaly well acquainted with: i) market conditions, market fluctuations etc. ii) new materials which can be profitably employed in place of old ones. This factor has a high savings potential. iii) What other manufacturers are ordering under ideal conditions. This he can find out from his suppliers.

He then can easily bring these valuable ideas to his own firm profitably. It is true that material manager may not probably make ultimate decisions by himself. However, he does play a prominent role in giving proper suggestions, since he is always in a better position to collect all the relevant facts about an item under value analysis study; he being closely associated with the market.

Value analysis to combat raw material shortages

Value analysis plays an important role when an organisation faces shortage of raw materials. The technique can then point out other alternatives which can be effectively substituted. The querries that are useful in dealing with such shortages appeared in the earlier list are given below:

1. Check if the product is unnecessarily overdesigned.
2. Check specifications employed in inducting raw material. Scrupulously examine the standards, whether they are too rigid?
3. Check if every component that goes to form the item is absolutely needed.
4. Can raw material and components with loose tolerance limits be employed.
5. Check if components of standard and easily available forms are used.
6. Whether suppliers have been informed about your problem/s. They may be in a better position to suggest alternatives or innovations, since they know what other customer of theirs order under similar conditions.
7. Can subassemblies be combined?

Principal areas of "value analysis" application

Emphasis of value analysis lies principally on cost reduction accompanied by bettering of design of an item, reconsidering its specifications, employing more efficient purchase methods and methods of manufacture; revision of make-or-buy decisions, and associated cost saving potential. Generally value analysis study is carried out with respect to the already existing items, however the technique can be extended to cover introduction of a new or innovated product. Value

analysis study also looks into the alternative routes of manufacture, alternative sources, alternative techniques and even an alternative for the product in hand which can do the same job more efficiently and/or with lesser cost.

Different steps involved in value analysis study

1. The first step is to identify the product and its functions that is taken up for value analysis study.

2. Find out different costs incurred in its production, like material cost, manufacturing cost, labour cost, over heads, costs due to finishing, packaging cost etc.

3. Consider carefully meaningful costs. Focus your mind on them. Meaningful costs come under two heads: a) The costs which are worth incurring but which are exhorbitantly high. b) Cost which get into an item unnecessarily (and unknowingly) without improving any of its value features.

4. Then apply the questioning technique already discussed.

5. **If needed do not hesitate to ask for experts help from outside the company**

It is a well-known fact that advancement in technology is so fast today that in every field or perhaps in every sub-branch of it there is a specialised know how and there are specialists who can implement this know how. Hence, often it is advantageous to consult such specialists from outside for building value in an item. Employees from the organisation should not look upon it as their defeat or failure. The technological knowledge is advancing at such a pace today that it is impossible for engineers and scientists of any single concern to keep themselves fully conservant with all the details of the latest developments in its field. This fact should be made clear to the concerned top ranking technical employees by the top management personnel. It should be borne in mind that without such an approach to implement new ideas and the latest specialised knowledge, the organisation is very likely to miss the opportunity of reducing costs and bettering value.

6. Identify yourself with the problem, ponder over it from various angles and directions for value alternatives and you will find that you strike at better and better solutions. Collective approach in this respect fetches wonderful results.

7. **Concentrate on performance of an item**

Today the trend in deveoped countries is that industries specify the function or performance they need and advertise for the item which at present satisfies the purpose or for any other suitable alternative that can carry out the same function reliably or in a better way.

Here you take advantage of ideas from suppliers; you bring them in picture. You make them think for you. If any one of them comes out with cheaper or better alternative you can appreciate and reward his efforts by placing orders for the new alternative for atleast some time to come. This point aims at benefitting through suppliers' ideas.

8. **Look for additional functions in the value alternative selected**

Now a days simply discovering or inventing value alternative is not enough. In this era of tough competition it is advisable to introduce come additional functions in the value alternative you have finally selected, perhaps at a little additional cost if needed be.

9. **To carry out your plans through, emphasise on figures**

Show that the value alternative arrived at is the least costly (or with the same cost it has some additional useful function which raises its selling potential). Indicate the potential savings and profits by way of its implementation in terms of concrete figures. Remember it is very difficult to argue against concrete figures of sales and profits. This approach helps in overcoming any opposition from within the organisation to the change contemplated.

How is value analysis carried out in practice?

The first job after identifying an item and its function/s is to collect all the relevant information about it. The information should be with respect to costs, sketches, specifications, production processes, basic and secondary functions, whether the product is imported or is indigenous, whether its raw materials are running in short supply etc.

The next step is to lodge a search for value alternative collectively through meetings following the techniques already discussed. Views of every one who come forward with suggestion/s are respected. All the view that are put forward are taken into consideration. This uncovers several possible value alternatives. Cost for each is worked out against its benefits i.e. cost benefit analysis is carried out for each one of them. Alternative which offers the highest savings is the only one that is taken into account with two or three more in the descending merits of their savings/profits potential.

Value alternatives which aim at employing indigenous material/s in place of imported ones are given specific importance from the point of view of savings on foreign exchange. So also those alternatives which aim at preserving scarce materials are specially considered even if they are little costly.

Points "for" and "against" each value alternative are carefully studied with unbiased wind till the final solution is reached. This solution is then put before all the concerned officers for suggestions and recommendations. This method

informs every one concerned in the company about the change that the company is contemplating to implement. Ultimately a final solution acceptable to all those concerned in the organisation is arrived at.

Specific points to be considered while applying value analysis technique

1. Priority should be given to those products where maximum savings is possible to achieve. This at once suggests that products with the highest yearly consumption rate should be considered preferentially. Monopoly items also fall in this category.

2. Value analysis is a technique that should be applied repeatedly. Even though its application does not fetch immediate gains the item should be reconsidered after a reasonable lapse of time say a year or two, when market position brings forth new materials of construction, new manufacturing methods, new sources of supply etc. Even those items which were preciously value analysed successfully should be considered again to reduce their costs, still further, if possible, in this way.

AVAILABLE IN BULK & SMALL PACKING

SULPHURIC ACID 98% & 70%
CHLOROSULPHONIC ACID
DILUTE NITRIC ACID 58%
ALUMINA SULPHATE
FERRIC/IRON FREE

Please Contact:

SDBB CHEMICALS (INDIA)

Head Office:
Satnarayan House,
Section 17, Ulhasnagar 421 003
Phones: 78238/75992/70096

Branch Office:
Ganga Jamuna Cinema Bldg.,
Tardeo, Bombay 400 007
Phones: 4922970/4944606

FOR YOUR REQUIREMENT OF

META CRESOL 40-42%
PURE META CRESOL 98%
PURE PARA CRESOL 98%
SODIUM SULPHITE 78-80% & 85%
ORTHO CRESOL 98%
ORTHO CRESOL 90%
RESORCINOL
METANILIC ACID

Manufactured by: ATUL PRODUCTS LTD.

PLEASE CONTACT DISTRIBUTORS/AUTHORISED AGENTS

CRESCENT CHEMICALS

Regd. Office: 404, Faiz-E-Qutbi, 375, Narsi Natha Street, Bombay 400 009.
Tel.: 342231/348096/348305 * Telex: 011-5412 CRES IN

Sales Office: 56-B, Sanjay Building, 5 Mittal Estate,
Andheri Kurla Road, Bombay 400 059.
Tel.: 6322697/6342320/6329110/6322136

25 CRESCENT SILVER JUBILEE

Science Briefs

TISSUE-CULTURE PLANT ESTABLISHED

A national facility that will have the capacity to produce up to two million plants when fully operational (within five years) is to be established at the Tata Institute of Energy Research's Gwah Pahari campus on the outskirts of Delhi. The Department of Biotechnology under the Indian Government has sanctioned this project under which the protocols developed by different laboratories for a number of plant species will be modified so as to make them suitable for large-scale multiplication in commercial quantities.

The facility is expected to start functioning in a year's time. It essentially makes the use of recent advances in research which have brought about a revolution both in plant propagation and plant improvement by applying techniques of protoplast fusion and genetic engineering. Tissue culture techniques are used in this process of rapid and true to type propagation.

The techniques of tissue culture essentially involve excising a tiny segment of a plant with preformed metistems. This small piece which is called explant is surface sterilised with a solution of dilute bleach. It is then placed on the sterile nutrient medium in a test tube or flask or pertriplate.

The medium includes all essential elements, trace elements, vitamins and sucrose. Depending on the type of growth required, the medium is supplemented either with a cytokinin or an auxin or certain undefined substances such as coconut milk. The cells of the explant rapidly divide resulting in a cellular mass known as "callus".

By altering the level or the nature of the added growth substances the cells of callus can be stimulated to produce a large number of young shoots or bipolar structure resembling the sexual embryos of the seed. These shoots can later be rooted and transferred to the soil.

Each leaf has axillary bud in the axil. Usually in nature these buds remain dormant due to the phenomenon called apical dominance. As observed in hedge plants when this terminal bud is cut down the lateral bud show bud break. Vegetative propagation is also achieved by sprouting of axillary buds. In tissue culture, these explants if cultured on a medium rich in cytokinin show bud break and usually more than one shoot appears from the axillary bud. These shoots if isolated or chopped to single node segments and cultured on medium of similar composition gie rise to more shoots and this process of shoot multiplication can be carried out indefinitely.

With each passage the number of shoots increases logarithmically. When a number of shoots are produced, they are transferred to roting medium. Using plant tissue culture technology, the plants can be propagated round the year irrespective of the season. Also the production rates are very high. The plants are clonally uniform and thus it is much easier to maintain uniform plantations.

-- P.T.I. Science Service,
April 16-30, 1990

AUTOMATIC ULTRASONIC VISCOMETER

The Central Scientific and Industrial Organisation (CSIO), Chandigarh, has developed an automatic ultrasonic viscometer that can help to precisely measure viscosity and clearly distinguish between various chemicals, medicines and drugs in process control industries.

The device is based on the magnetorestrictive property of nickel. When ferromagnetic materials are subjected to a magnetic field, produced by feeding current pulses of very short duration (say, about 10 per microsecond) to a coil wound around the top of a pure nickel strip, their physical dimensions change.

A direct current voltage proportional to the viscosity-density product is used to indicate the digital output after being processed by a microprocessor-based calibrator. The system can be mounted in a stand kept on a table or it can be permanently fixed on to the pipe carrying the process liquid for automatic and continuous on-line monitoring of viscosity in a process industry.

Experts estimate the future demand to be around 300 units every year. The process is available through the National Research Development Corporation (NRDC) for commercialisation, reports the journal "Invention Intelligence".

-- P.T.I. Science Service,
April 16-30, 1990

NOVEL ANTI-AIDS AND ANTI-FERTILITY AGENT

Scientists at the Centre for Cellular and Molecular Biology (CCMB), Hyderabad, have found that the potent bacterial inhibitor 'seminalplasmin' may also be an effective anti-AIDS agent. Dr. Pushp M. Bhargava, former Director of CCMB, said in Bombay recently that seminalplasmin specifically inhibits the binding of anti-CD4 antibodies with the Human Immuno Deficiency Virus (HIV).

"It can, in fact, displace HIV bound to the surface of lymphocytes and these observations suggest that seminalplasmin may be useful as an anti-AIDS agent", he said. Seminalplasmin, a 47-aminoacid protein discovered at CCMB some years ago, was initially found to be a potent inhibitor of bacterial growth.

Recent evidence indicates that a seminalplasmin like protein is also probably naturally present on the surface of

CD4-positive lymphocytes. Its presence on these cells suggests that it may play a role in the prevention of the AIDS infection. Dr. Bhargava also suggested that it could be used as diagnostic tool for AIDS, which would prove to be much cheaper and faster than the ELISA and the Western-blot methods.

CCMB scientists have chemically synthesised seminalplasmin and found it to be identical to the natural compound in all respects, including its biological activities. Seminalplasmin, which is secreted by the accessory sex glands of bulls also influences the functions of sperms. It binds to the plasma and acrosomal membranes of the sperm and increases the fluidity of membranes. Such changes are known to influence the acromosomal reaction and fertilising ability of sperms.

"In mammals, on the contrary, seminalplasmin was found to inhibit motility, acromosome reaction and fertilising ability of sperms in vitro", said Dr. Bhargava. Therefore it could be used as an antifertility agent. "At present experiments are in progress to evaluate the hypothesis that the low rates of fertility sometimes observed after artificial insemination in cattle are due to high levels of seminalplasmin in seminal plasmin", he said.

-- P.T.I. Science Service, April 16-30, 1990

DRIED BANANA POWDER — AN ANTI-NUD AGENT

Dried banana powder might turn out to be a useful agent in the treatment of nonulcer dyspepsia (NUD), according to researchers at the All India Institute of Medical Sciences, New Delhi. A study conducted by AIIMS researchers shows that dried banana powder is a safe and effective treatment for NUD, a condition marked by chronic abdominal pain, nausea and cramps.

The fact that banana powder is cheap, easily available and is a part of traditional Indian food prompted the researchers to investigate its properties as an anti NUD agent. The preliminary AIIMS investigation involved 46 patients with NUD in a prospective, randomised controlled trial.

The symptoms were partly or completely relieved within eight weeks in 75 per cent of those undergoing the treatment but only 20 per cent of the controls, the AIIMS researchers said in reporting their findings in the journal Lancet. The findings should be substantiated with double blind placebo-controlled trials.

-- P.T.I. Science Service, April 16-30, 1990

A NEW METHOD OF MAKING VANASPATI

Researchers in Calcutta have reported success with a new process of making vanaspati from vegetable oils by inter-esterification, which offers several advantages over the conventional hydrogenation process. At present, vanaspati is prepared by hydrogenation of a blend of vegetable oils of which the most common are soyabean, rice bran, palm sesame and sal.

Not only is hydrogenation an energy-intensive process, but it also leads to the formation of many trans-unsaturated acids, including the trans-isomeric acid of the essential fatty acid linoleic acid, which is undesirable from the health point of view.

Researchers at the Department of Chemical Technology, University of Calcutta, studied the efficacy of a new process involving inter-esterification of glycerides, which is employed in some of the developed countries to produce margarine and shortenings from liquid oils.

Using a number of liquid oils as such or in combination, they found that the inter-esterified products were comparable to vanaspati prepared by hydrogenation, as far as the nutritional quality was concerned.

The Calcutta researchers studied two kinds of esterifications — random and directed. The ester-ester interchange is random when the natural oils become oriented in their glyceride pattern so that the composition of the glyceride becomes identical to that obtained by esterifying glycerol with fatty acids.

They report that sal oil can be inter-esterified with cottonseed oil and sunflower-oil and mowrah with rice bran oil to yield products similar to vanaspati. Also, palm oil and its fractions can be better utilised in the inter-esterification reaction than hydrogenation.

The investigations further point out that if the inter-esterification is carried out in the presence of a catalyst, then the fatty acid distribution cannot be specific making the process unsuitable for products like cocoa butter. However, enzymatic inter-esterification is better than conventional catalytic process. The inter-esterification process has recently been included by the Central Committee of Food Standards.

-- P.T.I. Science Service, April 16-30, 1990

NONEDIBLE WILD OILS TO REPLACE DIESEL

The search for alternate fuels, prompted by escalating petrol and diesel prices, has yielded a new breed of fuel blends made from nonedible wild oils. Two such blends made from neem and mahua oils might soon help run diesel engines in the agricultural sector which guzzle up nearly 18 per cent of India's total diesel consumption.

Researchers at the Indian Institute of Technology in New Delhi working on these nonedible oil substitutes for diesel believe a major use of these new blends could be in powering irrigation pumps used in farms across the country.

The IIT New Delhi group has demonstrated that neem oil extracted from the tree, Azadirchta indica, a mahua oil from the species, Maduca indica and Maduca longofolia, can help substitute diesel. Both, the neem and mahua species grow wildly across the country, specially in the states of Madhya Pradesh, Uttar Pradesh, Gujarat and Maharashtra.

"These nonedible oils are available in surplus quantities", says Professor H.B. Mathur, head of the group working on alternate fuels at the IIT department of mechanical engineering. "There is a huge untapped potential", he said.

The annual production potential of mahua oil has been estimated to be about 400,000 tonnes, while current production figures reach barely 30,000 tonnes. Neem oil too is underexploited. While current production touches about 100,000 tonnes per year, the total potential is expected to be four times that amount.

The IIT team has conducted extensive trials with blends made up of a mixture of mahua oil and diesel and neem oil and diesel on 5 to 10 horse power four-stroke engines and the two-stroke conventional diesel engines.

Blends with varying compositions were used to determine the maximum amount of diesel substitution possible and to find the optimum blend that can be used with minimal modifications to existing diesel engines.

The IIT group also conducted endurance tests on diesel engines powered by these new fuel blends made by mixing diesel and the nonedible oils. During these tests, scores of individual components of the engine were examined before and after nearly 512 hours of engine operation, the engine running 16 hours a day for more than a month.

Engine performance characteristics observed during the use of these wild oil blends are similar to those seen in engines working on pure diesel oil, said Dr. Mathur. "We're now ready for field trials", he said.

There is however a slight difference in the efficiency, resulting from the relatively lower calorific value of the wild oils. The calorific value of diesel is about 10,500 kilocalories per kilogram (kcal/kg) while neem oil and mahua oil have calorific values of 9400 kcal/kg and 7200 kcal/kg. The lower calorific value of these oils leads to a nominal lowering of the engine output and efficiency when the blend is introduced.

"But this slight reduction in the output and efficiency does not in any way affect the ability of the engine to meet the requirements of the end utility", Dr. Mathur said.

The idea is to use these fuel blends for stationary engines which operate under fixed load and fixed speed conditions. This would help divert the saved diesel than the agricultural sector to the transport sector, reducing the overall diesel consumption, said Dr. Mathur.

The IIT experiments show that a blend containing 35 per cent of neem oil can bring about a reduction of about 28 per cent in specific diesel consumption.

With the mahua oil blend, savings in diesel consumption are achieved by using a mixture containing 20 per cent of the mahua oil. The decrease in the efficiency is less than four per cent at any range of engine operation.

The use of blends also substantially lowers the exhaust gas temperature over the entire range of the engine load. This is a welcome feature as it could prolong the life of the exhaust valve, according to the Indian Institute of Technology scientists who presented the findings of their experiments with the wild oil blends at an international conference on energy and environment held in Miami, United States, last December.

During the seventies, the IIT group had pioneered research on the use of ethanol as a substitute for petrol. "Ethanol-substitution is now a well-established technology", says Dr. Mathur. But the nonedible neem and mahua oils are so far the first candidates for a diesel substitute.

-- P.T.I. Science Service, April 16-30, 1990

UNIQUE DEGASSING SYSTEM

A Japanese company has developed an on-line system that employs a unique degassing technique consisting of a special plastic membrane that is gas permeable but stops liquids, the journal "prism" said.

The system completely removes gases (atmospheric components like nitrogen, oxygen and carbon dioxide) dissolved in water from conduits to prevent red "rust" water and to inhibit growth of microorganisms and generation of odours.

The water engering this system first reaches a vacuum container where the dissolved gases are separated by the gas-liquid separation membrane and exhausted into a vacuum chamber without any assistance from chemicals or heating.

These gases are released through a vacuum pump while the degassed water is passed on for consumption. For instance, water at 25 degrees celsius normally contains 8.1 ppm of oxygen, which is reduced to less than 0.5 ppm after it passes through this system just once.

The system is available in two variations: one with a degassing capacity of one tonne per hour and another with a capacity of three tonnes per hour.

-- P.T.I. Science Service, April 16-30, 1990

Remote Sensing and Petroleum Seepage in Exploration*

Dr. R.H. CLARKE
BP Petroleum Development Ltd., London EC2Y 9BU, UK.

Introduction

Although petroleum exploration has been undertaken in most parts of the world many unexplored frontiers remain. The exploration of some areas is uneconomic with the methods usually applied; gravity and magnetic survey interpretation followed by seismic and drilling. Many operators have recognised that remote sensing methods can potentially be used to review frontiers and focus attention on the more attractive parts. However, most actual applications of remote sensing have been straightforward synoptic photogeology. Attempts to find direct hydrocarbon indications in remote sensing data involve principles which originated with the pioneers of petroleum exploration, who routinely use seeps as a basis for choosing where to explore. The development of such principles involves an understanding of:

1. The geological factors which control petroleum seepage.
2. The environmental factors which determine the appearance of petroleum seepage at the Earth's surface.
3. The characteristics of remote sensing devices.

The first topic will be touched on in the next section but the second is possibly the most interesting. Environmental factors profoundly influence the visibility of seepage at the Earth's surface and exert a rigid control on the sorts of remotely sensed observations which might find petroleum under any given conditions. Despite this, the topic has received little attention since seismic reflection surveys became the backbone of most exploration programmes, and "surface geochemistry" assumed a subordinate role or was dropped from exploration programmes altogether.

Nowadays we must also be concerned with the characteristics of the observations made by remote sensing devices. Careful engineering can produce results which would have been envied by our predecessors but no amount of "image processing" can extract significant information from a sensor which is blind to the surface features, if any, which distinguish oilfields from their surroundings.

Oil exploration resembles hunting for the proverbial needle in a haystack. Fortunately many traps are large and may have an obvious expression on seismic sections. Where traps are not obvious on seismic or where regional seismic coverage is too expensive to obtain, remote sensing can help focus exploration investment if it is able to take advantage of two characteristics of petroleum; its buoyancy and its detectability. Petroleum seeapage is driven mostly by buoyancy, which acts vertically. Consequently if a systematic map of seep occurence is generated by remote sensing it can be used to restrict the search for at least some of the petroleum in a province by mapping its occurrence on to the surface two-dimensional plane. Petroleum has physical and chemical characteristics which favour its detection at small concentration levels by remote sensing at the Earth's surface. The fluorescence of fresh oil on the sea surface, for example, makes it detectable at levels of a few milligrams/m^2.

The challenge is to develop reliable remote sensing methods which have necessary sensitivity and a low enough unit cost to enable regional surveys to be undertaken at a fraction of the cost seismic. Seeps have been extensively used in the past to locate successful exploration wells in frontier provinces. Lees and Richardson (1940) describe how "surface indications of oil and gas are a great help in the search for oilfields. Gas escapes are associated with all the existing fields (in Iran and Iraq), and oil seepages with four of them".

Petroleum seeps

Petroleum seepage is found wherever there are oil and gas fields, both discovered and yet to be found. Hovland and Judd (1988) have published maps showing that petroleum seepage in the form of gas bubble plumes and seabed features are widespread in offshore petroleum provinces. BP's unpublished records show that there are typically about a hundred recorded seeps in each onshore province and that few entirely lack recorded flowing seeps. Many groups of seeps occur where there is no petroleum production, both onshore and offshore, but always in places where oilfields might occur. Seeps are seldom if ever found where basement rocks occur at the surface, although petroleum impregnations may occur in such rocks.

The majority of oilfields are gassy. The gas may be dissolved entirely in the oil or may form a separate gas cap. Figure 1 shows what happens when a globule of a typical reservoired oil is brought to the surface. The oil shrinks slightly as the gas exsolves from it while the gas expands to many times its original volume by the time it has reached the surface. The result is a gas bubble lined with a thin film of oil. Oilfields produce gassy seeps, whether the seep arises from the oil leg or from the gas cap.

The importance of gas in the mechanics of petroleum seepage arises from its buoyancy. Gas is barely susceptible to

* Presented to ENERGY SEMINAR, Delhi, 11th January 1989 and Bombay, 17th January 1989 held under the auspices of the UK Energy Council.

hydrodyanamic displacement in subsurface aquifers (Hubbert, 1953) which will consequently have little effect on the path taken by seep through the overburden. The only important consequence of a seep getting into an aquifer is that the seep is likely to be destroyed by dissolution or biological oxidation. In general seeps emerge at the surface from fractures and it is likely that they pass through a network of such fractures (including open and permeable fault planes) on their way from traps to the surface. A strongly anisotropic fabric such as that imposed by overthrusting may cause seeps to travel obliquely towards the surface. Otherwise buoyancy should ensure that they move vertically and that their surface occurrency (with the proviso noted below) should map onto the traps from which they originate.

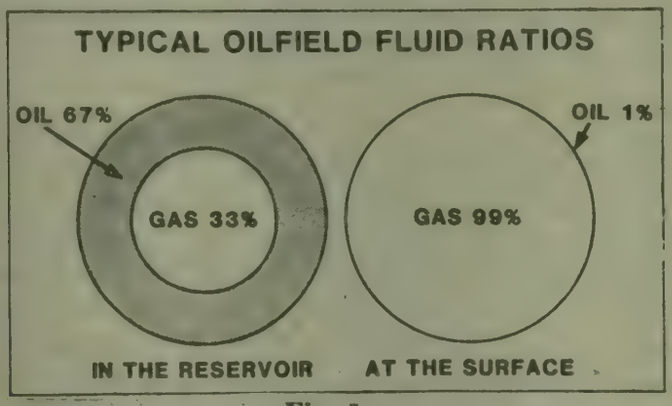


Fig. 1
Typical oilfield fluid ratios in the reservoir and at the surface

There is little overlap in time or space between the migration of petroleum from source to trap and from trap to surface. Seepage can occur wherever trapped mobile petroleum occurs, and at any time after the traps were filled. Source to trap migration can only occur when maturing source rocks expel petroleum at considerable depth.

In summary, petroleum seepage is quite distinct from source to trap migration and tends to be driven by gas buoyancy vertically from trap to surface through fracture networks. Subsurface aquifers are more likely to destroy seeps than to displace them.

Seep alteration

Subsurface alteration

Alteration caused by seeps can happen at the Earth's surface or deep in the subsurface. Both the seep and the surrounding medium will be affected. It is important to recognise the difference between surface and subsurface alteration effects. Subsurface effects upon rock sequences can accumulate over a long period of time and produce dramatic evidence of past or present petroleum occurrence if uplifted and exposed by erosion. Unfortunately, such uplift may cause the trap to breach. Subsurface effects can also modify the composition of seep petroleum.

There appear to be several mechanisms by which seep petroleum can be altered as it rises to the surface. If pore waters contain sulphate, possibly because there are evaporites in the rock sequence, sulphate-reducing bacteria may alter part of the gassy component of a seep, producing hydrogen sulphide. Thomas (1952) records how this mechanism has apparently caused the seeping gas from some Iranian fields to become sour, although the only evidence of the process he could find is the occurrence of spongy araonitic limestone replacing anhydrides and primary gypsum. Kyle and Price (1986) confirmed that such "bioepigenetic" carbonate and hydrogen sulphide production is caused by sulphate-reducing bacteria which live on a diet of seeping petroleum in sulphate-bearing rock sequences.

More recently it has been shown that ferric iron may also be used as a terminal electron acceptor for acetate oxidation by another class of anaerobic bacteria (Lovely, et al., 1987), producing copious quantities of extracellular magnetite. Acetates are not a component of unaltered petroleum but are often found in associated pore waters, possibly as a result of the bacterial alteration of petroleum. Such alteration may provide a food source for magnetite producers in seep pathways which could allow them to precipitate sufficient magnetite in the vicinity of seeps to be detectable as a magnetic anomaly. This provides a speculative explanation for the observations of Donovan (1974) and others, that seeps appear to be associated with magnetic anomalies.

Surface dispersal

Even the most prolific seeps bring relatively modest amounts of petroleum to the surface. The largest recorded seeps, off California, produce about a million cubic feet of gas per day (Guthrie & Rowley, 1983) and 50 barrels of oil per day (Allen et al., 1970). These are impressive numbers but trivial in comparison to the volume of the Santa Barbara Channel into which they flow and in which tidal and fixed currents are continuosly replacing the water. Most seeps produce a small fraction of these amounts. Consequently the dispersal processes which operate at the Earth's surface are likely to dilute seep petroleum in the surrounding air, water, soil or sediment so that they are seldom easily detectable.

Such dilution has given rise to the notion that "microseepage" is a process whereby low concentrations of petroleum somehow diffuse out of oilfields to the surface. Seep gas undoubtedly diffuses from its point of emission into the near-surface environment into the soil, sediment, water or atmosphere, over a distance of metres, but is most unlikely to diffuse in measurable amounts to the surface from an accumulation, which may lie kilometres below the surface.

Offshore

The dispersal of seep petroleum offshore happens in two

distinct ways. If the seabed is made of consolidated rock or any deposit lacking matrix permeability, seeps will readily emerge into the water column as gassy bubble plumes. Such plumes have been observed in petroleum provinces throughout the world on echo sounder traces and shallow seismic records. They may rise to the surface. If the bubbles are oily, slicks or emulsions of oil at the surface will define the approximate location of seeps. Bubbles rise at rates which often exceed the velocities of ocean currents. Consequently their emergence at the surface is seldom further away from the seep vents than a distance equivalent to the water depth. Slicks produced by such plumes may drift down current. Dilution, especially in rough water, causes such seeps to disappear quite rapidly.

If the seabed consists of matrix-permeable unconsolidated sediment, bubble plumes may still occur, but some or all of the seep is likely to become trapped in the sediment, producing characteristic "gas-blanking" effects on shallow seismic records. Sulphate reducers and oxygen-using microorganisms may oxidise some of the trapped seep gas, or gas hydrates may form, in deep water.

Onshore

The dispersal of seep petroleum onshore is complicated by the occurrence of a water table, usually some metres below the surface (Figure 2). Gas buoyancy can only act in a water filled medium, consequently the water table is a significant barrier to the movement of seep petroleum. The visibility of onshore seeps depends upon the proximity of the water table to the surface. There are essentially three possibilities:

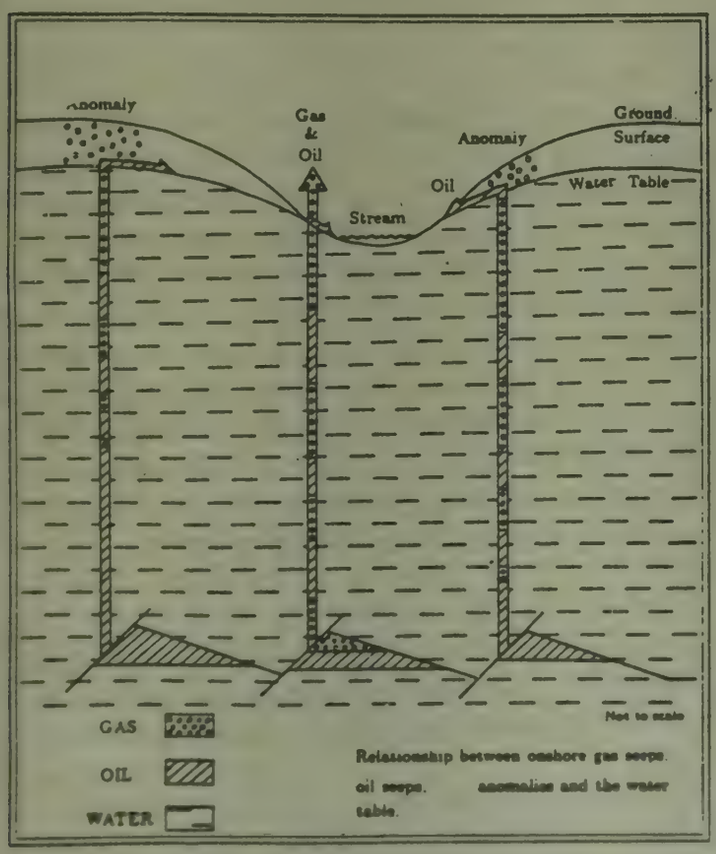


Fig. 2
Onshore seepage disposal models

1. Water table at the surface. In a stream, lake, or swamp seep petroleum can rise all the way to the surface driven by buoyancy. The composition of seeps is usually gassy, reflecting the composition of the whole petroleum. Any entrained water may well be salty, basin water.

2. Water table below the surface near a spring line. In such circumstances petroleum segregates at the water table. The gas disperses into the soil atmosphere and is likely to be consumed by a alkanotrophic microorganisms. The oil is swept along the water table towards the spring line where it may emerge as an oil seep. Such oil seeps are typically biodegraded, gas free, and associated with fresh water in humid environments.

3. Water table below the surface elsewhere. In the vast majority of cases seeps will encounter the water table some distance from a spring line. Both the oil and the gas are likely to be oxidised and destroyed invisibly.

These models for the dispersal of onshore seepage are based upon unpublished BP field records. "Water table oil" was widely recognised as a misleading indication of the occurrence of petroleum by BP's pioneer explorers. They recognised that permeable soils could allow such oil to travel considerable distances laterally before emerging, and that the oxidation the oil could suffer on the way might make it difficult to distinguish from oil impregnations associated with outcrops of fossil migraion pathways, breached oil pools, or even source rocks.

BP has collected information concerning two hundred seeps in Papua New Guinea. Oil seeps are only found associated with surface water (Figure 3). Gas seeps occur predominantly in streams but a few occur on dry land. Furthermore, the only seeps associated with salty water are gassy (Figure 4). This is almost paradoxical since such seeps generally emerge in streams, in a very wet part of the world, and suggests that the buoyancy of the seep gas is capable of lifting basin water as petroleum to the surface.

Surface alteration

Seep petroleum can be consumed at the surface by alkanotrophic microorganisms (Davis, 1967). Seeps may also burn (McLintock, 1932). Hovland and Judd (1988) have described a variety of biological communities which live around seep vents on the sea floor. Some use components of the petroleum as food while other are attracted to the hard substrate which shell pavements and carbonate crusts provide for their

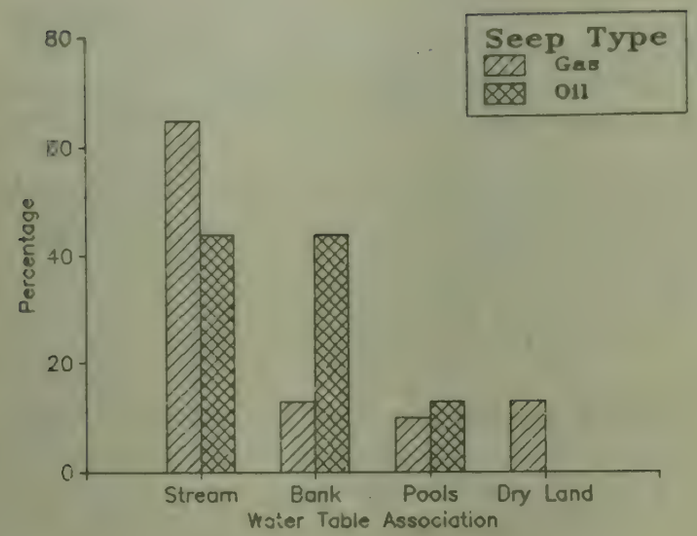


Fig. 3
Relationship between seep type and surface environment in Papua New Guinea

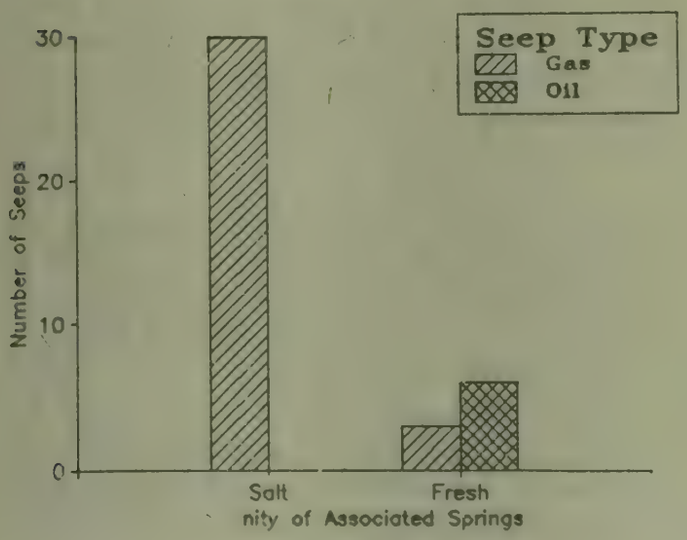


Fig. 4
Relationship between seep type and associated water in Papua New Guinea

growth. The carbonate crusts are "bacterial aragonite" presumed to form as a result of an excess of carbon dioxide building up in near surface sediment as seep methane is oxidised. The carbon dioxide is believed to induce the precipitation of carbonate. A similar process could operate onshore and a superabundance of carbonate in the soil, or anomalous C^{13} values have been used for prospecting. Secondary carbonate can also form at depth by the alteration of gypsum and anhydride. Unfortunately, distinguishing the shallow or deep origin of anomalous onshore carbonate has not usually been attempted.

The most dramatic and historically significant of the surface effects of petroleum seepage are the "gach-i-turush" occurrences described from southwest Iran (Thomas, 1952) but occurring in many other parts of the world. Gach-i-turush is a local Iranian name for "sour earth". Gassy seeps produce grey barren surfaces, chiefly composed of powdery gypsum with disseminated sulphur and a pore filling consisting of sulphuric acid. Such surfaces are found in arid areas on limestones, primary gypsum rock or calcareous mudstones. Where silicates were present in the unaltered rock, jarosite is also common. Asphaltic oil residues are also found in the gach-i-turush, which may be too hot to touch because of the rapid oxidation going on. Most of the gach-i-turush phenomena are ascribed to the oxidation of hydrogen sulphide in the seep gas stream in the moist and oxygenated zone above the water table, producing sulphuric acid. The acid attacks most surface rocks producing the gach-i-turush mineral assemblage. Patches of gach-i-turush may cover areas several tons of metres square.

Sulphur-bearing springs and some other types of sulphur occurrence, which are related to gach-i-turush, may also be useful indicators of sour gas seepage.

Surface alteration effects may be obscured by newly deposited sediments, especiallly blown sand, or by vegetation in non-arid regions. In vegetated regions the alkanotroph populations in the soil may have significant effects upon soil composition and upon the plant communities living in seepage-affected areas. There has been little scientific study of such effects.

Detection of seepage

Detector design

A knowledge of the fate of seep petroleum in surface environments is of considerable importance in the design of remote sensing detectors. Despite this most remote sensing users have relied on oilfields, rather than seeps, as their "training set" targets, begging the question as to whether oilfields seep in a manner which allows oilfield outlines to be used as adequate targets for the development of technique. The literature based on such work is unsatisfactory because authors have ignored the assumptions involved in their work. It is safer to disentangle the problem of finding seeps, which is essentially an engineering issue, from the geological problems surrounding the relationship between seeps and oilfields.

The design of seep detection equipment is an extensive topic, the details of which lie beyond the scope of this paper. The most important parameters are unit cost, sensitivity, and directness.

Unit cost

A great attraction of satellite imagery is the miniscule cost of each pixel of information. Any effective remote sensing system must have a cost per unit area which is orders of mag-

nitude less than seismic otherwise it will not be used. This places firm limits on the design of useful systems.

Sensitivity

Some properties of petroleum are much easier to detect than others. At sea, for example, oil's surfactant and fluorescent properties make oil detectable at extremely low concentrations from remote platforms. There are no equivalent properties which can readily be used onshore to detect seeps directly, consequently indirect methods appear to be essential for surveying the land.

Directness

Direct detection of a property of the petroleum itself is ideal and is practical offshore. Indirect methods appear to be essential over the land, increasing uncertainty about the validity of the results. Several indirect methods have been suggested, based on:

1. **Surface alteration.** The alteration effects outlined in the previous section are, in principle, detectable, and may have secondary effects which could also be detected by sensors of suitable design.

2. **Altered vegetation.** Much of the Earth's land surface is vegetated, although the proportion now covered by natural vegetation is rapidly shrinking. Seeps may affect vegetation directly, or indirectly by causing cumulative effects on the landscape which have a secondary effect on the vegetation. BP is sponsoring work (Muller & Dalton, 1988) which could lead to the development of a practical image simulator using ray tracing techniques which are conceptually similar to those used for understanding seismic records. Simulation may provide scope for parameterising the complexity of natural landscapes to enable explorers to isolate aspects of images which are characteristic of seep-affected areas. The geometry of the land surface and its effect on image colour and illumination may be a fruitful line to follow.

3. **Subsurface alteration.** Donovan (1974) suggested that seeps may have magnetic anomalies associated with them. Recent work on anaerobic magnetite producers, summarised in the previous section (Lovely et al., 1987), indicates that a mechanism for the formation of such anomalies exists, although it is not the one proposed by Donovan.

Remote sensing is usually conducted from aircraft or satellites. Aircraft have the advantage that tailor-made sensors can be built and flown in areas of exploration interest at reasonable cost and on practical timescales. Satellite sensors tend to be designed for general applications and few have been useful for detecting petroleum seepage effects. However, the cost and availability of satellite images make them attractive and provide an impetus for developing exploration applications.

Satellite sensors

The Landsat Thematic Mapper (TM) is the first sensor with the resolution, both spatial and spectral, to detect surface alteration caused by petroleum seepage with any confidence. The most obvious examples known to BP are the sulphur springs in northern Iraq, which produce high albedo soils where their flow dissipates in the desert to the south of the anticlines from which they flow. We have also looked for *gach-i-turush* occurrences on TM images of Iranian and Iraqi fields but without conclusive results. The next generation of resource satellites (Landsat-6, Japanese ERS-1) may be more productive.

It may be several years before the simulation of images provides a method for understanding the complexity of natural landscapes such that the detection of seeps in vegetated areas becomes possible. It is important to recognise that although surface observations will be essential to confirm the validity of such work, the availability of satellite images has made landscape analysis practical for the first time. The images themselves will be the principal data in the development of the science.

Airborne sensors

BP is currently (December 1988) operating an airborne laser fluorosensor to find petroleum seepage offshore (Clarke et al., 1988). The instrument has been selected for development ahead of other possibilities for three reasons:

1. Low unit cost of operations.
2. The high proportion of petroleum seeps which reach the surface more or less unaltered offshore, as opposed to onshore, allowing a direct detection method to be used.
3. The sensitivity of the fluorescence detection technique.

Despite these considerable advantages there is probably a larger area remaining to be explored for oil onshore than offshore and the rewards for developing an effective onshore survey technique could be substantial.

Conclusions

Remote sensing has a role to play in the detection of seepage in exploration frontiers, where it can help reduce costs and focus effort. Successful technique development requires that the geological and environmental effects on seepage are understood and that the engineering of detector systems is based upon trials over real seeps. Dispersal in near-surface environments strongly affects the detectability of seeps. Alteration is less important offshore. Alteration onshore may give rise to useful secondary effects on the land surface which may form the basis for detecting seeps using satellite images. Survey cost, sensitivity and directness appear to be the most

important parameters on which detector design should be founded. BF is using satellite and airborne remote sensing data for seep detection, with current emphasis upon the latter.

I am grateful to BP Petroleum Development Ltd. for permission to publish this paper, and to many colleagues for their help and advice, in particular to Robin Cleverly for providing several of the examples and for help with the TEX printing.

References

Allen A.A., Schlueter R.S. & Milokaj P.G. 1970. Natural oil seepage at Coal Oil Point, Santa Barbara, California. *Science 170, 974-977.*

Clarke R.H., Grant A.L., Macpherson M.T., Stevens D.G. & Stevenson M. 1988. Petroleum exploration with BP's Airborne Laser Fluorosensor. *Proceedings: Indonesian Petroleum Association, 17th Annual Convention, 387-395.*

Davis J.B. 1967. Petroleum Microbiology. *Elsevier, Amsterdam, 604pp.*

Donovan T.J. 1974. Petroleum microseepage at Cement, Oklahoma; evidence and mechanism. *Bull. American Association of Petroleum Geologists 58, 429-446.*

Guthrie L.D. & Rowley P.R. 1983. Containment of naturally occurring subsea hydrocarbon emission - a project review. *OTC paper 4446, Houston*

Hovland M. & Judd A.G. 1988. Seabed Pockmarks and Seepages Impact on Geology, Biology and the Marine Environment. *Graham & Trotman London, 293 pp.*

Hubbert M.K. 1953. Entrapment of petroleum under hydrodynamic conditions. *Bull. American Association of Petroleum Geologists 37, 1954-2026*

Kyle J.R. & Price P.E. 1986. Metallic sulfide mineralisation in salt-dome cap rocks, Gulf Coast, USA. *Transactions Institute of Mining and Metallurgy 95B, 6-16.*

Lees G.M. & Richardson F.D.S. 1940. The geology of the oilfield belt of SW Iran and Iraq. *Geological Magazine 77, 227-252.*

Lovely D.R., Stolz J.F., Nord G.L. & Phillips E.J.P. 1987. Anaerobic production of magnetite by a dissimilatory iron-reducing microorganism. *Nature 330, 252-254.*

McLintock W.P.F. 1932. On the metamorphism produced by the combustion of hydrocarbons in the tertiary sediments of south-west Persia. *Mineralogical Magazine 23/139, 207-226.*

Muller-J.P. & Dalton M. 1988. Application of ray-tracing to satellite image understanding. *Published in ESA SP-284 (IGARSS '88), Edinburgh, 4pp*

Thomas A.N. 1952. 'Gach-i-Turush' and associated phenomena in south-west Persia. *VII Convegno Nazionale Del Metano E Del Petrolio Taormina, Section 1, 13pp.*

FOR SALE

Light Magnesium Carbonate

(conforming to IS 1420-1972

and

Precipitated Calcium Carbonate (96%)

Containing 3-4% $MgCO_3$

For Your requirements Please Contact:

CAL CHEMFAB ALKALIES LIMITED

Gnanananda Place
Kalapet,
PONDICHERRY 605 104

FOR YOUR REQUIREMENTS OF:

SODIUM CARBOXY METHYL CELLULOSE (C.M.C.)

CELLPRO -- HVB, LVB, MVB, DVB, LSW II, LSH

CEPOL -- HV, MV, LV, UV, UUV, DV, DV (SPL), HVP, MVP, LVP, UVP, DVP, DVP (SPL).

SODIUM ALGINATE - MV, MVR, MVR (SPL)

CELLULOSE POWDER - CP 100, CP-X, CP-60

M.C.A./S.M.C.A.

MCCP (SPL)

AGAR AGAR (CHINA GRASS)

POLY VINYL ALCOHOL (PVA) 198 & 279
Hot & cold water soluble

METHYL CHLORO ACETATE (MCA)

ETHYL CHLORO ACETATE (ECA)

ISO PROPYL CHLORO ACETATE (IPCA)

Manufactured by:

CELLULOSE PRODUCTS OF INDIA LTD.

Also available: ACETIC ACID GLACIAL 98%

Please Contact:

R.K. CHEMICALS

308, Samuel Street, Vadgadi, Bombay 400 003. Tel.: 339208; Resi.: 6051686, 6288655

A Reliable Source Of Supply For

HIGH EXHAUST REACTIVE DYES

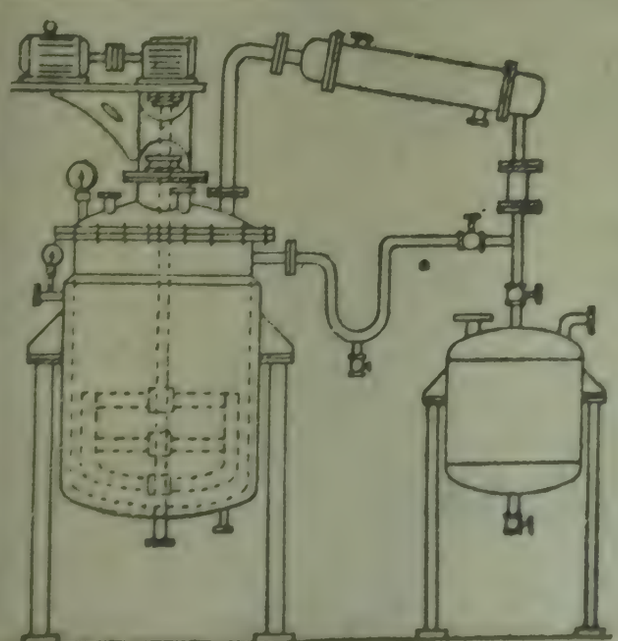
CCI Re Yellow HE 4G	CCI Re Red HE8B	Keyactive Jade Grade HE4B
CCI Re Golden Yellow HER	CCI Re Brown HER	Keyactive Green HE4BD
CCI Re Orange HE2R	CCI Re Brown HE4R	Keyactive Dark Green HE7B
CCI Re Red HE5B	Keyactive Navy Blue HER	Keyactive Black HERL
CCI Re Red HE3B	Keyactive Navy Blue HE2R	Keyactive Blue HERD
CCI Re Red HE7B	Keyactive Navy Blue HE5R	Keyactive Purple HE3R

Please Contact the Manufacturers:

Colour & Chemical Industries
Kusum Enterprises

Sales Office:
44, Gaya Building, 4th Floor,
109, Yusuf Meharali Road, Bombay 400 003.
Phone: Off: 345581 Resi.: 6720195
Gram: HONEYSUN, Bombay 90.
Telex: 11-71227 CCJ IN.

Works:
Plot No. J-719/2, 40,
Shed Area, GIDC,
Vapi (Gujarat).
Tel.: 1446



For your requirement of

* REACTION VESSEL
* CONDENSORS
* STORAGE TANKS
* PRESSURE VESSELS
* COLUMNS/RECEIVERS
* HEATING UNIT

We design and fabricate the above and any type of equipments in S.S./M.S./M.S. Rubberlined/Lead Bonded. We also undertake the erection and commissioning of the complete plant.

KRISHNA ENGINEERING CORPORATION

Office: 49, Kailash Apartment No. 3, Rambaug, S.V. Road, Behind Himalaya School, Borivli (West), Bombay 400 092

Factory: Bhayandar (East), District Thane.

Phones: O/R. 6060632 Factory: 6982830

We are in search of a finishing agent which will give excellent silky effect after finish on cotton, white and dyed. Please offer, we assure regular business.

Apply to

Box No. 1235
CHEMICAL WEEKLY
306, Shri Hanuman Industrial Estate, G.D. Ambekar Road, Wadala, Bombay 400 031.

Reliable Sources of Micronised Minerals
ANY MESH ALL GRADES
From 75 Microns Upto 1.0 Microns
DOLOMITE, CALCITE, SOAPSTONE, CHINA-CLAY ETC.
MICRONISED ZIRCON -- Indian Substitute of TiO_2

JET-O-MIZERS (INDIA)

Head Office:
1, Old Industrial Area, Alwar - 301 001, (Raj).
Tel. No. 20109, 20939 Telex No. 366-201 SPCI IN

Delhi Office:
1E15, Jhandewalan Extension, Ground Floor, New Delhi 110 055.
Tel. No. 527804, 776159 Telex No. 031-66360 RAMA IN

FOR YOUR BULK & REGULAR REQUIREMENT OF

260/1969
ISI

1. Alumina-Sulphate (Non Ferric Alum)
as per IS-260/1969 with ISI Mark
in slab form of 25-30 Kg.
in Kibbled form
in Powder form (upto 250 Mesh).

2. Alumina-Ferric
as per IS-299/1980
in Slab/Kibbled/Powder form

Contact or write to Manufacturer:

KORBA CHEMICALS

G.S. HOUSE, MAIN ROAD, KORBA (M.P.)
Gram: MAHALAXMI. Tel.: 49 & 649

News about New Projects

KUWAIT NEARS APPROVAL FOR $2BN SHUAIBA PLAN

Kuwait Petroleum Corp. (KPC) looks all set to win approval for its $2bn petrochemicals complex in the Shuaiba industrial area. The proposal calls for a worldscale cracker plus associated downstream units. Oil minister Sheikh Ali al-Khalifa al-Sabah, who also chairs KPC, presented the proposal to the Supreme Planning Council recently, but the meeting broke up before a decision was made. Nevertheless, KPC officials have expressed their confidence that the ambitious project will get the green light from the government imminently.

KPC's proposal calls for a 750,000 ton/year ethylene cracker based on ethane-rich gas with the option of other feedstocks. Kuwait will obtain the feedstock from the output of associated gas from its oil fields.

Associated with the cracker, KPC has plans to build an array of downstream units. KPC officials confirmed that some 250,000 ton/year of liquid ethylene would find itself on the export market. The remainder is earmarked for other units at the complex.

The KPC proposal calls for the construction of a 265,000 ton/year high/linear low density polyethylene production facility. Moreover, there are plans for a 163,000 ton/year monoethylene glycol and 17,000 ton/year diethylene and triethylene glycol unit.

Aromatics production is also slated at the complex. KPC intends to make 300,000 ton/year benzene all of which will feed a 385,000 ton/year styrene monomer unit. Some 150,000 ton/year of this styrene production has been earmarked for the site's polystyrene manufacture while the remainder is set for the export market.

Similarly bound for the export is the product from the slated 400,000 ton/year paraxylene and 150,000 ton/year orthoxylene facilities. If all goes to plan KFC expects the plant will come on stream in 1995. KPC sources confirmed that the company is preparing the documents inviting firms to offer technology. The company hopes to have all technologies selected by the year end. Contracts will also be selected at that time.

SHOWA DENKO PLANS CRACKER

Japanese major Showa Denko is planning a third ethylene cracker which, when onstream should make the company Japan's largest ethylene producer. The 500,000 ton/year facility is to be built at Oita — the site of its existing two crackers. Construction should start in 1993 and commissioning is set for 1995.

Ethylene capacity was raised by 96,000 ton/year in April last year, bringing capacity at Oita to 600,000 ton/year. A further expansion of existing capacity to 800,000 ton/year is scheduled for 1991. In March of the same year a 60,000 ton/year ldPE unit will also come onstream at Oita.

Meanwhile, a Yen60bn ($394m) joint venture ethylene project by Sumitomo Chemical, Mitsui Petrochemical Industries and Maruzen Petrochemical is undergoing environmental assessment by Chiba Prefecture and Japan's Ministry of International Trade and Industry (MITI). The final go-ahead will come from them, but the timing is unknown.

The 500-600,000 ton/year cracker is to be built at Chiba, and partners estimate it could come onstream in mid 1993. Exact shareholdings are yet to be decided, and the technology and contractors have not been selected. Output from the plant will go to the partners, in proportion to their shareholdings.

A recently announced linear low density polyethylene joint venture between Sumitomo Chemical and Tosoh has been named Chiba Polyethylene. Contractors for the project will be appointed this autumn, according to Sumitomo.

AMOCO CONFIRMS US PP PROJECT

Amoco Chemical is to construct a 136,000 ton/year polypropylene unit at its Chocolate Bayou plant near Alvin, Texas. It will be based on Amoco's proprietary gas-phase process and high-yield catalyst and produce a full range of PP grades, including homo- and copolymer and high impact material.

Amoco hopes the realisation of the project, due for completion in 1992, will position the company as a contender in international licensing, taking on established processes offered by Himont and BASF.

Amoco Chemical's president, Robert D. Cadieux, claims Amoco has made significant technological improvements to the process in recent years. "We believe we now have a superior process and catalyst package that will allow us to compete worldwide". The catalyst technology is said to streamline the manufacturing steps.

Amoco is the second ranked producer in the US. Its two existing PP units at Chocolate Bayou produce 363,000 ton/year, and it also runs units in Cedar Bayou, Texas and Geel, Belgium.

EXXON EXPANDS IN COATING POLYMERS

In an BF400m ($11m) investment, Exxon is installing a large autoclave reactor at its Antwerp polymers plant on the left bank of the river Schelde. The move is part of broader strategy to build up production of coating polymers for packaging and photographic paper industries at Antwerp, while concentrating production of general purpose copo-

lymers at its Meerhout site, also in Belgium.

The new 85,000 ton/year reactor will be installed alongside an existing 100,000 ton/year tubular reactor, sharing the same set of compressors. Exxon will be able to switch production from one to the other, according to product requirements. The new unit will free smaller autoclaves at the site for production of speciality polymers.

Detailed engineering underway already, is being handled jointly by Exxon and Simon Carves. The UK company is also contractor for the project. Start-up is scheduled from second half of 1991. An Exxon spokesman confirms that, should the need arise, the new reactor could be fitted with its own compressors, enabling it to be run simultaneously with the adjacent tubular reactor.

DAVY MCKEE WINS VENEZUELAN FIRST

Davy McKee London has won its first contract in Venezuela. The company is to provide basic engineering for a methanol plant to be built at Jose in the state of Anzoategui.

The award comes from state-owned Pequiven and its partner in the venture Ecofuel, subsidiary of the Italian state energy group ENI. Plans call for a 2,000 ton/day plant set to come onstream in the second quarter of 1993. Another methanol plant is planned by Pequiven at the same location in a joint venture with Mitsubishi.

Pequiven and Ecofuel are also partners in an MTBE project at Jose —Superoctanos. This project calls for a 500,000 ton/year unit being built by Snamprogetti and Tecnoconsult and due onstream in Q1 1991.

Talks on a joint venture between Pequiven, Ecofuel and Canada's Nova over a methanol/MTBE joint venture are continuing. A Pequiven spokesman says there may be news at the end of April.

PENTA SEEKS APPROVAL FOR TURKISH CRACKER JV

Penta Dis Ticaret, the Turkish petrochemical trading company, has submitted a proposal to the Turkish state authorities to build a new naphtha cracker, according to Faruk Erkoc, president of the company.

The company envisages a 300,000 ton/year cracker to be built at Yarimca — the site of an existing 60,000 ton/-year cracker of the state-owned petrochemical concern, Petkim.

Penta's partner in the proposal is a Japanese company, believed to be Mitsui. Neither Penta nor Mitsui could confirm this. The proposal has gone before the housing development and public participation administration —the government organisation responsible for all the privatisation projects in Turkey. The feedback so far is that the project is too big for an immediate decision on its future to be made.

Penta has also been negotiating with a "major US manufacturer" for the production of ABS in Turkey. Plans call for a 24,000 ton/year unit near Istanbul. The partner is understood to have other new projects in mind in Eastern Europe. It is believed that a decision on the Turkish venture could hinge on the outcome of these plans. At the moment, the ABS project appears to be on hold.

The Turkish trader first turned its attention to production in 1987 when it announced plans for styrene/ethylbenzene and polystyrene production at Aliaga. Petkim's privatisation has delayed this. Feedstock supply for the styrene/ethylbenzene unit would come from Petkim.

At the moment, a start-up date of 1993 is tentatively envisaged for the 100,000 ton/year styrene unit. An exact date for this and the 60,000 ton/year polystyrene unit will not be announced until Petkim's privatisation plans are firmed up. Erkoc explains the plant could be expanded beyond initial captive needs to 150-160,000 ton/year, depending on demand from Turkey's SBR industry and on whether Penta's ABS joint venture proceeds.

As to Petkim's privatisation, it seems the government is intending to float 15-20 per cent of the group's stocks on the Istanbul stock exchange.Erkoc says if the shares are floated, "We (Penta) are definitely interested in buying some percentage of it."

IMPORTS WILL FEED GULF PLANS

Private investors in the Gulf states are queuing up to fill gaps in the region's petrochemicals portfolio. Most petrochemicals production in the region is based on natural gas feedstocks but two groups, one in Saudi Arabia and another in Dubai, are seeking to break this feedstock stranglehold.

Saudi trading firm Alastra revealed plans for polyester fibre and linear alkylbenzene (LAB) facilities. Alastra president Mohammed Alaudin Asaad said that his firm intends to select Far Eastern partners to diversify into chemicals manufacture.

Alastra's proposals call for construction at Yanbu of a $40m 40-5[illegible]00 ton/year polyester fibres plant and a $20m 25-35,000 ton/year LAB facility. The company has completed its market feasibility studies and is now actively engaged in courting joint venture partners. Established marketing experience will be an important qualification for any partner, Asaad said.

For LAB, Alastra intends sourcing benzene feedstock from Eastern Europe. The company has looked at UOP and Phillips technology but is keen on a Far

Eastern process. It is likely that either India or Pakistan will provide the contractor.

LAB is currently not produced in the GCC region but Alastra is aware of plenty of customers in the area. Potential customers include three sulphonation units each in Saudi Arabia and Iraq; two in North Yemen; and one each in Qatar, Kuwait, South Yemen and Dubai.

Aslastra intends to source ethylene glycol feedstock from Sabic but will need to import terephthalic acid. Nevertheless, both Sabic and Iraq are planning to build PTA units. "It is likely that our plans will encourage them to proceed", added Asaad.

He reckons that the polyester fibres partner will come from the Far East with Japan's Teijin and South Korea's Hanyang emerging as favourites. Alastra expects to select partners by the end of the year. But it does not intend to build both units straightaway. The first unit will be onstream by 1994, the second by 1998.

Dubai also offers good investment opportunities, according to potential petrochemicals investor Jamal Al Ghurair. Al Ghurair is examining the possibility of getting into the petrochemicals business.

"The free trade zone in Dubai, plus the incentives of no taxes, cheap labour, low energy costs and the speed with which plans can be approved, will encourage businesses to invest in the area", Al Ghurair explained. Al Ghurair believes the burgeoning industrialisation of Dubai will promote opportunities for local manufacture of products such as PP, PVC and polyester fibres.

AKZO REINFORCES BRAZILIAN FIBRES

Akzo's Brazilian subsidiary Polyenka, the largest player in the country's textile polyester filaments market with a 35 per cent share, has announced investments of $15m to expand its plant at Americana, Sao Paulo state. It will increase capacity by an average of 3,000 ton/year over the next three years, taking output from 19,600 ton/year to 28,000 ton/year by 1993.

Output is being hiked to met increasing domestic demand, which is rising at over 10 per cent/year, surpassing the demand for natural fibres. Polyekna has recently cut its exports to around £4m to help satisfy domestic consumers.

JAPANESE TDI JV

A toluene diisocyanate (TDI) joint venture has been set up in Japan to produce and sell the product, by partners Asahi-Olin and Mitsui Toatsu. It will be called Kyodo TDI and will operate from tokyo.

The venture will produce TDI at Mitsui Toatsu's existing facility at Omuta. This is to be expanded by 27,000 ton/year by July 1990. The existing capacity of the unit is 35,000 ton/year.

Asahi-Olin is itself a joint venture of Japan's Asahi Glass and Olin of the US. It produces polyether polyols, and urethane systems and intermediates.

RHONE-POULENC TO INVEST $120M IN FRENCH TiO_2

New EEC regulations on titanium dioxide waste disposal, adopted in 1989 for application in August 1992, have spurred Rhone-Poulenc to link environmental adjustments to capacity expansion. The company's Thann et Mulhouse unit in Le Havre will be expanded from the current 95,000 ton/year to 135,000 ton/year by 1994/95.

Raymong Bonneau, general manager of Rhone-Poulenc's fine minerals division explained that capacity expansion will be phased in to coincide with new environmental rules. Further regulations for waste disposal are due to be taken by the EC Commission in 1992 for implementation in 1995.

Debottlenecking and the installation of new equipment will go hand in hand in stages. Though the Le Havre unit is already well within prescribed environmental limits for waste disposal at sea, new rules will involve setting up land deposits of demineralised product.

The Thann et Mulhouse unit has submitted its expansion request to the local administrative authorities and the group has approved the investment, which will be around FF700m ($122m) over the next four years. Bonneau hopes for authorisation within the next few months and some 5-6,000 ton new capacity should be onstream by mid-1991.

The neutralisation process is a proprietary one and, by 1995, when full capacity comes onstream, the unit will fully comply with EC rules of no dumping at sea. Land has already been purchased for waste deposits which will all be neutralised.

Bonneau says the extra capcity will supply what has been a rather tight market over the last four or five years. World titanium dioxide producers have been working at full capacity and debottlenecking wherever possible. Over the long term he believes demand should grow by 4-5 per cent/year, though in the short term, he fears demand may slump due to economic recession already perceptible in the US and, to a lesser extent, in the UK.

DYNO FORGES COMECON LINKS

Norway's Dyno Industrier has forged new links with Eastern Europe with the announcement of a formaldehyde plant to be built in a joint venture with East Germany and an explosives plant for the USSR. The East German project is a

50:50 partnership with AHB-Chemie to produce 80,000 ton/year formaldehyde for an 85,000 ton/year adhesives plant in Gent, Belgium.

Production, based on Dyno's Formox iron molybdenum oxide process is scheduled for mid-1991 start-up. Dyno will be responsible for engineering, and construction will be undertaken by Belgian contractors. The product is destined for the Belgian particle board industry and Dyno will be able to shut down its SCM Sluiskil plant in the Netherlands, which now supplies the Belgian market.

AHB-Chemie, however, will now be able to satisfy local demand from its Leuna Werke plant, which has been supplying the Belgian industry. Leuna Werke is one of East Germany's biggest chemicals producers, and has developed a strategy for internationalisation, with particular focus on EC markets. Annual turnover at the new plant is expected to be around $25m.

Meanwhile, in the USSR, Dyno has established a joint venture, Nitro Sibir, with the Soviet Coal ministry (51:49) to construct an explosives factory. A plant at Nerungy, Siberia, will produce 25,000 ton/year repulping emulsion for coalmining explosives.

PEMEX FORMS PETROCHEMICALS JVS

Pemex, Mexico's state-owned oil and petrochemicals organisation, has arranged joint venture schemes to progress plans for its Morelos complex in Veracruz state. The move follows the setting up of a separate petrochemicals department within Pemex under the control of Raul Robles Seguras.

The first deal has been signed with Celulosa y Derivados (Cydsa). The private company has agreed to provide $11.2m to help complete the 50,000 ton/year acrylonitrile plant at the Morelos site. In return, it will be supplied with product at a contracted price.

A second deal has been signed with Celanese Mexicana to help with construction of an acetaldehyde plant. Celanese Mexicana uses acetaldehyde in its production of acetic acid.

Pemex is believed to be seeking other partners, especially from Europe, to further plans for Morelos and other projects in Mexico. Investment has been hampered by the state oil company's cash flow problems. Plants for propylene derivatives are high on the list.

According to Pemex, other plants planned for Morelos include propylene (350,000 ton/year); polypropylene (100,000 ton/year); isopropanol (75,000 ton/year) and butadiene (100,000 ton/year). Other sites in Mexico planned for development are Tabasco and Tula.

INDONESIAN PE TAKES SHAPE

A $250m project to build Indonesia's first polyethylene plant, in which BP Chemicals has a majority share, is taking shape. All partners have board approval and the project is sanctioned by the Investment Co-ordinating Board (BKPM) and supported by the ministry of industry.

The plant will be built on a 50-hectare site in Cilegon, Rawa Arum, near Merak on the West Java coast. A joint venture company, PT Petrokimia Nusantara Interindo (PT Peni), is being formed to run the plant. Shareholders are BP Chemicals (51 per cent), PT Arseto Petrokimia (15 per cent), Mr Sigit Harjojudanto (9 per cent), and Japanese companies Mitsui (12.5 per cent) and Sumitomo (12.5 per cent).

Phase one of the project comprises two lldPE/hdPE swing lines, based on BP Chemicals' gas phase process, each with a capacity of 100,000 ton/year. A BP spokesman was unable to give any idea of scale or timing for the second phase, though a doubling of capacity seems plausible.

The main contractor for phase one is Japan's Ube Industries, which is believed to have won the contract against competition from Mitsui Engineering and Foster Wheeler/Chiyoda. Construction will take 28 months and start up should be in Q3 1992.

JORDAN FERTILISERS

Belgium's Coppee Lavalin was expected to sign a turnkey contract with Jordan Phosphate Mines Co. (JPMC) to revamp its Aqaba fertiliser plant. In a 50:50 partnership with France's Bouygues, the Belgian contractor will be increasing capacity of phosphoric acid from 280,500 to 445,500 ton.

"We are in negotiations for a final package in Oman now", said Jean Gillain, Coppee's general manager of international marketing. He could not confirm the $30m price tag put on the project, but said that Jordan would put up half the money and that there was likely to be a soft loan from the Belgian and French contractors.

The Kuwait Fund for Economic Development is also to lend around $16m to support the Aqaba plant, part of which will be used for the revamp. The World Bank has allocated around $3.5m to Aqaba, as part of a $25m loan to JPMC to expand this plant and increase phosphate rock production at Shidiya with the construction of a 1.5m ton/year beneficiation unit.

Gillain saaid plans to increase diammonium phosphate (DAP) to 720,000 ton/year at Aqaba, were less certain as JPMC had recently signed a contract with Mitsubishi Heavy Industries for a new DAP plant. This unit will be supplied by the extra phosphoric acid being added at Aqaba.

MAJOR RETHINK WILL BOOST BRAZILIAN PETROCHEMICALS

Brazil's ministry of development (MD) has decided to review the national

petrochemicals programme (PNP), since previously scheduled capacity will not meet demand forecast for mid-1995. PNP now estimates total investments of $8bn throughout the 1990s.

The MD has formalised the expansion of Copesul by 350,000 ton/year at $470m and Triunfo's cracker will produce 927,000 ton/year of ethylene by mid 1994. Also, minor changes have been confirmed for the Sergipe, Rio de Janeiro and Sao Paulo complexes.

The MD wants to secure the traditional 20 per cent excess on basic and downstream petrochemicals production for exports. Triunfo's feedstock demand for PVC/VCM, phenyl/acetone and PE, are to be met locally, avoiding imports. Existing downstream projects will be debottlenecked and new capacities are likely to be commissioned. To soften the impact on financial institutions, Copensul is supposed to finance its own expansion.

Other modifications in the PNP confirm the replacement by Copene of 200,000 ton/year ethylene capacity, originally planned at Sergipe's chlorochemicals complex and now to be set up at Camacari. Copene's own expansion will provide 910,000 ton/year ethylene by the early 1990s.

An agreement has been signed by the MD, Sergipe regional authorities and Petrobras subsidiaries for a chlorochemicals complex. A new 250,000 ton/year methanol and 420,000 ton/year acetic acid project is to be located at Sergipe. Likely bidders are Cloroetil (a Shell/FAM jv) and Rhodia. A recommendation has been made that Petrobras supply local gas and through its subsidiary Petromisa, the mining of sodium chloride.

A proposed chloro/soda unit, to be erected in Sergipe by Salgema, and originally planned to produce 150,000 ton chlorine and 135,000 ton caustic soda, will be expanded to 200,000 ton and 180,000 ton/year, respectively. A complementary 50,000 ton/year propylene oxide unit, to be built by Salgema, will now have 100,000 ton/year capacity, pending local raw material availability.

Raw materials production will also be increased at Sao Paulo, with the MD authorising the setting up of a 100,000 ton/year propylene processing unit at the Cubatao refinery, to supply a 100,000 ton/year PP project by Poliolefinas. At Rio de Janeiro, Reduc refinery will also set up a similar 110,000 ton/year propylene unit to meet demand from Braspol's 100,000 ton/year PP project in Duque de Caxias.

Brazilian industrialists comment that the goal for 1990s to achieve 1m ton/year ethylene capacity in the three main producing regions is nearly complete. With the modifications introduced in PNP, Copene will have 1.1m ton, Copesul 927,000 ton, serving both Camacari and Triunfo, Petro Rio 545,000 ton and PqU 460,000 ton/year.

JGC PICKED FOR TAIWANESE PX

The Japanese contractor JGC has been awarded a Yen 22bn ($152m) lump-sum, turnkey contract to build a paraxylene plant for Chinese Petroleum Corp. (CPC) of Taiwan.

JGC, which picked up the contract against competition from Chiyoda and Foster Wheeler France, will handle detailed design, procurement and construction services for the 200,000 ton/year plant to be located at Lin-Yuan, in Kaohsiung.

The project is to separate and recover paraxylene (PX) from mixed aromatics streams, which will be supplied from CPC's CCR plant in Talin, now also under construction by JGC. The plant consists of a BTX extraction unit, isomerisation unit, transalkylation unit and a PX separation unit, using molecular sieves.

The PX unit will come onstream in 1992 along with a 50,000 ton/year orthoxylene (OX) unit and a 506,737 ton/year BTX extraction unit. The PX and OX units will be based on UOP technology, and the BTX unit on Arco's.

More projects are coming onstream at CPC's Kaohsiung site in 1993. They include plants for 140,000 ton/year benzene, 130,000 ton/year toluene and 110,000 ton/year xylenes — all based on UOP technology, and being engineered by Fu-Tai.

In the same year, a 400,000 ton/year ethylene plant is planned to start up. Kellogg is providing technology and engineering and CTCI is carrying out construction.

DU PONT'S SPANISH SITE SHAPES UP

Plans for Du Pont's first greenfield site in Spain were due to firm up recently with the signing of letters of intent to develop a production site in the principality of Asturias in the northwest of the country.

Du Pont company chairman Edgar S. Woolard Jnr was set to sign letters of intent with national authorities in Madrid and regional authorities in Asturias in order to commence a $200m investment at a site between Ariles to the northwest, Gijon to the northeast and Oviedo to the south..

The first plant to be built on the 350 hectare site will be for Nomex aramid fibre. This is set to go onstream in 1992. Asturias will be developed in a similar way to Du Pont's other sites in Europe, such as Dordrecht in the Netherlands and May-down in Northern Ireland, explained a company spokesman. It could well end up as a manufacturing site for four or five product lines in years ahead. The spokesman predicted that the Nomex facility would be built before plans are confirmed for further production at the site.

Environment

GERMAN CABINET PASSES LIABILITY BILL

The West German cabinet has passed a controversial bill mandating liability insurance for damage to the environment. The bill is scheduled to be debated by parliament before year end.

The provisions which are strongly opposed by the chemical industry, would make manufacturers liable for environmental damage caused by their plants, even during normal operation and regardless of fault. Operators of plants believed to pose a severe threat would have to prove they have taken sufficient steps to prevent pollution.

Federal justice minister Hans Engelhard said he believes the legislation will improve the chances of injured parties receiving financial compensation without adversely affecting plant profitability, while environment minister Klaus Topfer said potentially heavy fines for non-compliance would be an effective means of preventing pollution. But the Greens have labelled the bill "a joke". The burden of proof has not been shifted to industry, nor has the "lion's share" of environmental damage been taken into account, they claim.

The insurance sector has hinted that it may not be willing to provide insurance for all potential environmental threats.

CFC 123 ALL CLEAR?

CFC 123, one of the leading candidates to replace fully halogenated CFCs as a refrigerant and foam blowing agent, will indeed be less damaging to the ozone layer, scientists at the Massachusetts Institute of Technology have concluded.

Ronald Prinn and Amram Golombek have used a three-dimensional computer model of atmospheric circulation to assess the likely effects of the new chemical. They conclude the average lifetime of CFC 123 in the atmosphere would be about 1.5 years.

Some 88 per cent would be destroyed by chemical reactions with hydroxyl radicals at altitudes below 12 kilometres, well below the stratospheric ozone layer (at about 22 kilometres). The calculated destruction rate is greatest in the equatorial region below 2 km.

BASF UNIT REMOVES HEAVY METALS

As part of a comprehensive programme to upgrade on-site waste treatment facilities, BASF has commissioned a DM40m ($23.7m) new unit to remove heavy metals from the aqueous effluent of the flue gas scrubbers, which service the power plants and rotary kiln incinerators at its Ludwigshafen complex.

The new unit, designed and installed by Philipp Muller of Stuttgart, receives the aqueous effuent from the prewash stages of the flue gas scrubbers. This effluent, which contains the heavy metals dissolved in hydrochloric, hydrofluoric and sulphuric acids, is neutralised in a two-step purification process using calcium hydroxide. The precipitated heavy metal hydroxides are separated off, using flocculation agents, and concentrated.

Treated effluent is then piped to a treatment plant, where the solids —primarily gypsum and fluorspar —are removed and dried. BASF claims tests over the eight months since the unit was installed have shown final metal concentrations in the effluent are below the permitted limits of 0.05 ppm cadmium; 0.5 ppm chromium; 0.5 ppm copper; 0.05 ppm mercury; 0.5 ppm nickel; 0.1 ppm lead and 1 ppm zinc. Prior to the installation of the new unit, scrubbed water was piped direct to the waste water treatment plant where the heavy metal concentration was reduced by 70-90 per cent.

DOW BARRIER CUTS CO_2 DIFFUSION

Researchers at Dow Europe's R & D facility in Terneuzen, the Netherlands, are working on a new inner lining material for refrigerators that will prevent carbon dioxide from diffusing from the insulation foam. Such diffusion lowers insulation efficiency in the long term.

Carbon dioxide, which is generated by the water/isocyanate reaction in the manufacture of polyurethanes, has recently been introduced as a 50:50 co-blowing agent to reduce the use of ozone-depleting CFC-11.

But Dow has found reducing the CFC content by more than 50 per cent leads to a gradual loss in insulation efficiency as the carbon dioxide diffuses from the foam. It believes its new inner liner material, essentially a barrier added to the conventionally used high-impact polystyrene, will overcome the problem.

Trials are being carried out in conjunction with West German refrigerator manufacturers, Bosch-Siemens and AEG. Both companies introduced commercial refrigerator ranges with 50 per cent CFC reduced insulation in 1989.

GREEN PRESSURE CLOSES EAST GERMAN PLANTS

East Germany has closed production plants for viscose fibres and chlorides in the Bitterfeld area and a fibres plant at Pirna, environment minister Peter Diederich has told West German federal minister Klaus Topfer.

Diederich said his government is currently reviewing licences for some 400 production plants, including many chemical plants, which have been oper-

ating with temporary permits for a number of years. Observers on both sides of the border have pointed to outdated technology at the plants, which are seen as an acute threat to the environment.

The two governments are preparing clean-up plans for a number of chemical production complexes in East Germany, but it is believed many others will have to shut down because clean-up would be too costly.

Topfer said he believes the environmental technology gap between the two parts of Germany can be closed within 10 years. In addition to the DM 1bn/Ostmark 1bn anti-pollution programme announced in December, East Germany has asked the West German government to provide a further DM300m ($177.5m) for older projects not yet concluded.

East Germany will also divert some DM1bn of its foreign exchange intake from Western visitors to environmental projects, Diederich said.

An East-West German environment committee is now discussing possibilities for implementing 15 environmental clean-up projects agreed under the joint anti-pollution programme for which no contracts have yet been awarded.

The projects have been held up because of confusion over competency within the East German government, sources in West Germany say.

US SENATE FORCES MC PHASE-OUT

The US Senate has voted to force the phase-out of US production of methyl chloroform by the year 2000.

The amendment to the Clean Air Act, as proposed by senator John Chaffee, would require a production freeze on methyl chloroform at 1989 levels with a 50 per cent reduction by 1996 and a complete ban on production by the year 2000. Chaffee says adoption of the amendment would eliminate nearly half the global problem — the US produces 41 per cent of all methyl chloroform.

Industry opponents of the amendment claim unilateral action would not help the environment, but would put US industries at a competitive disadvantage and impede the work of US negotiators trying to strengthen international controls on ozone-depleting chemicals through the Montreal protocol.

The US has proposed that methyl chloride is added to the protocol and phased out in accordance with other Western industrialised nations.

AVAILABLE EX-STOCK

WE TAKE EXTRA CARE • INDIAN GUM INDUSTRIES LTD. •

* PROPYLENE GLYCOL USP (DOW)
* MANNITOL BP/USP PYRAZOLONE FREE
* D-CALCIUM PANTOTHENATE
* LACTOSE
* HYDROXYL AMINE SULPHATE
* N-ACETYL SULPHONILYL CHLORIDE
* METHYLENE CHLORIDE
* ISO BUTYL BENZENE
* NEO PENTYL GLYCOL
* 2 CHLORO PROPIONIC ACID

L/A Enquiries are also entertained

Indian Gum Industries Limited

(Recognised Export House)

51-A, Maker Chamber IV, Nariman Point, Bombay 400 021.

Telex: 2139 IGUM. Tel.: 243711-12-30-60

For Your Requirements Of:

Ammonium Bifluoride, Barium Fluoride, Calcium Fluoride (Pure), Copper Fluobrate, Fluoboric Acid, Lead Fluoborate, Magnesium Fluoride, Nickel Fluoride, Potassium Fluoride, Potassium Bifluoride, Potassium Fluoborate, Potassium Titanium Fluoride, Potassium-Zirconium Fluoride, Sodium Fluoride, Sodium Cryolite, Sodium Bifluoride, Sodium Fluoborate, Sodium Silico Fluoride, Tin Fluoborate, Tin Sulphate, Tin Chloride, Lithium Bromide Powder, Lithium Bromide Solution, Lithium Chloride Powder, Lithium Chloride Solution, Lithium Fluoride and other Fluorine Chemicals.

Please Contact:

M/s. SHREE JALARAM CHEMICALS

5, Kesar Chawl, Balrajeshwar Road,
Next to Fabina Mills,
Mulund (West),
BOMBAY - 400 080.
Gram: THREESTAR, Bombay-400 080

M/s. SHREENIVAS CHEMICAL INDUSTRIES

C-3/102, Veena Nagar,
L.B.S. Marg,
Mulund (West),
BOMBAY - 400 080.
Phone: 561 81 26 Off./Resi.

TRADEIMPEX INTERNATIONAL

CONVEYS ITS REGARDS TO ITS ESTEEMED CLIENTS AND PATRONS FOR THE TRUST AND CONFIDENCE PLACED IN US FOR A DECADE OF SERVICES RENDERED TO TRADE AND INDUSTRIES. WE FURTHER SOLICIT YOUR REGULAR ENQUIRIES FOR ALL PHARMARACEUTICAL RAW MATERIALS, INTERMEDIATES AND CHEMICALS.

Contact:

B.R. VORA

40-B, Mangaldas Building No. 1,
Princess Street,
BOMBAY - 400 002.
Phone: 310843

INTRODUCING

DIISOPROPYLAMINE

FOR THE TRADE ENQUIRIES CONTACT

POST BOX NO. 19159

BOMBAY - 400 025

Biotechnology

ICI OUTLINES PROSPECTS FROM BIOTECHNOLOGY R & D

The long-awaited fruits of biotechnology are now beginning to be realised, Peter Doyle, ICI's research and technology director, told journalists 24 hours after the company announced its annual results for 1989. In particular, ICI has high hopes for a biotech-derived drug for advanced colon cancer; its Biopol biodegradable plastic and, in the longer-term, for genetically modified fruit and cereal crops.

According to Doyle, ICI now spends well over £300m/year ($508m) on bioscience research. "Biotechnology, though certainly not the largest component (of the total spent), is growing rapidly", he said. He estimated it currently accounts for around £20m/year.

Alex Markham of ICI Pharmaceuticals revealed the company has identified a monoclonal antibody based agent active against advanced colon cancer. He believes the new agent is the closest to the "magic bullet" concept achieved to date. Initial results in animal models look "extremely promising" and phase I clinical trials will begin this year in the UK.

The breakthrough has been achieved by combining genetically modified ricin with a target-specific monoclonal antibody. Ricin consists of two chains: the A chain is the killer agent, but is non-toxic until it enters a cell; the B chain binds to cells indiscriminately. By removing the indiscriminate B chain and combining killer A chain with a cancer-cell-specific monoclonal antibody, ICI has achieved the basis for what it believes will be a very powerful therapeutic for the 1990s.

"There is a desperate clinical need for an agent against advanced colon cancers", says Markham. He hopes regulatory approval will be granted within five years. With around 100,000 new cases/year of advanced colon cancers diagnosed in Europe, potential sales are estimated at "hundreds of millions of pounds"

ICI also has exploratory programmes under way, aimed at designing highly specific monoclonal antibodies for pancreas and gastric cancers. Meanwhile, Steve Bungard of ICI's Biological Products said the company would test market its Biopol biodegradable plastic this year in the cosmetics field. The plastic, which comprises polyhydroxybutyrate (PHB) made by the Alcaligenes eutrophus bacterium in response to nitrogen deficiency, is produced by fermentation at Billingham.

Biopol will be expensive compared with conventional plastics. When the process is commercialised, Bungard expects the prices will come down to "four to five times that of conventional polyethylene". "Its first uses are expected where price is less important than the ability to degrade", he acknowledges.

For a lower cost product, ICI is also looking at the possibility of blending Biopol with conventional plastics. Another cost-cutting option would be to manufacture the PHB in seeds. Preliminary laboratory work is underway.

The majority of seeds research, however, is directed towards developing pesticide and herbicide resistance crops. Closest to the market are corn strains resistant to the European corn borer and corn root worm, two of the major threats to corn. These improved strains are expected to reach the market in the mid-1990s. "The difficulty is not identifying the gene, but in the ability to get the DNA introduced into the corn to come through in the seed", explains Bill Rathmell of ICI Agrochemicals.

For the longer term, ICI is also looking to develop crops with improved resistance to drought and cold, and to soils with high salt and aluminium concentrations.

SB REPORTS EMINASE BOOST

Smithkline Beecham claims new data confirm its Eminase blood clot dissolving agent can reduce the mortality rate of heart-attack patients in the long term as well as in the short term.

Doctors at the Royal Sussex County Hospital in Brighton, UK, report in The Lancet that patients treated with Eminase (antistreplase) were 43 per cent less likely to have died 12 months after their attack than those not receiving the drug. Previously, Eminase had been shown to achieve a 50 per cent reduction in mortality after 30 days. The doctors say Eminase given in conjunction with aspirin may improve chances of survival still further.

Eminase was launched in the UK by Beecham in May 1989 and became available in the US at the beginning of February this year. It is expected to be a major competitor to Genentech's tissue plasminogen activator. Analysts estimate Eminase to have a market value of about £150m/year ($255m) in the early 1990s.

GENENTECH BEGINS RELAXIN TRIALS

Genentech has begun phase I clinical trials of its genetically engineered relaxin hormone designed to ease child birth. Relaxin is a naturally occurring hormone produced in highest levels during pregnancy. Genentech says it appears to have a role in childbirth by relaxing, or softening, the cervix and birth canal.

The clinical trials, on non-pregnant volunteers, aim to evaluate relaxin's potential to facilitate natural childbirth in women who suffer from toxaemia or diabetes complications, or who are more than three weeks overdue.

For Your Requirements Of:

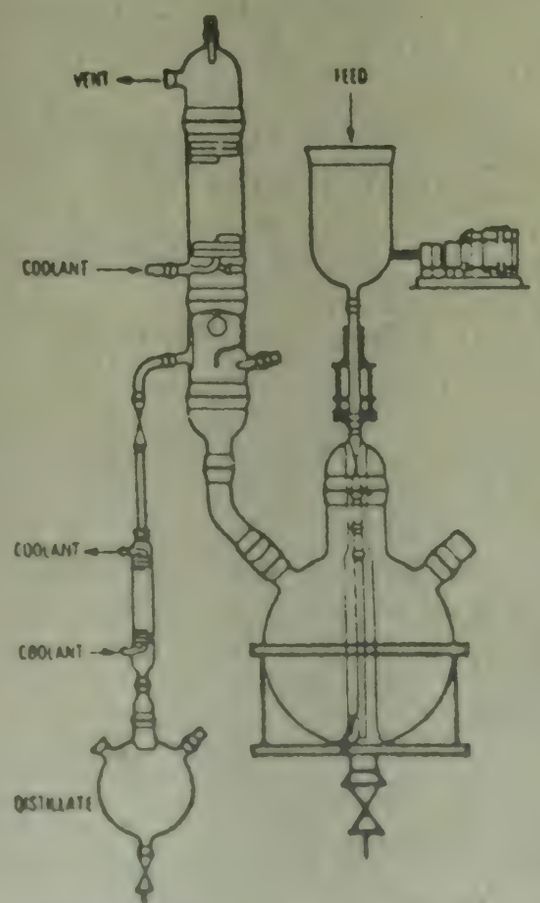
META DI NITRO BENZENE
META NITRO ANILINE
META AMINO ACETANILIDE
4 NITRO 2 AMINO PHENOL

CONTACT MANUFACTURERS

Mangalam Organics Pvt. Ltd.

Regd. Office: 292, Princess Street, 2nd Floor, Near Flyover, Bombay-400 002.
Gram: DHOOTUDYOG • Phones: 317969 • 317411 • 317489 Telex: 011-4643 MRPL IN

Factory: Plot No. 1203, G.I.D.C., VAPI, Dist. Valsad, Gujarat, Phone: 930 Telex 183-256 SMPL IN.



Reaction Assembly with High Speed Stirrer

Now Readily Available

ALL GLASS REACTION & DISTILLATION UNITS UPTO 200 Lts.
PIPELINES & FITTINGS UPTO 12" DIAMETER
TEFLON VALVES & GLASS STOPCOCKS
COLUMN COMPONENTS & HEAT EXCHANGERS
COMPLETE STRUCTURE & ERECTION OF ABOVE ITEMS

1" DRAIN VALVE	Rs. 800
1" LINE VALVE	Rs. 850
1 1/2" DRAIN VALVE	Rs. 1,050
1 1/2" LINE VALVE	Rs. 1,150

ALSO AVAILABLE ROTAMETER OF ALL TYPES

Please Contact:

M/s. GLASS BLOW INDUSTRIES

Sai Zarokha Bldg., 4th Floor,
Adarsh Society Road,
Opp. Mahila College, Malad (West),
Bombay 400 064.
Phone No.: 6821564 Mr. J.L. Garg

MARKET INFORMATION

PVA Up, Dyes Intermediates Mixed

Non arrival of imported materials pushed up prices of PVA 117 from Rs. 115 to 125/kg and gohsenol GH-17 from Rs. 110 to Rs. 128/kg. Acute shortage of sodium nitrite pushed prices upto Rs. 1,300/kg. Mixed changes in the dyes intermediates with particularly prices of blue base going up to Rs. 365. Cyanuric chloride to Rs. 142, J acid to Rs. 330 N-methyl J acid to Rs. 510, para amino benzoic acid to Rs. 360, MTD to Rs. 130. Prices of some intermediates went down particularly dimethyl aniline to Rs. 65, diamino stilbene disulphonic acid Rs. 155, J acid urea Rs. 380, meta ureido aniline Rs. 180 MPD local Rs. 160.

We cannot guarantee the accuracy of the prices published in CHEMICAL WEEKLY as they are based only on the enquiries made by our correspondent – and, as such they are not FIRM PRICES as between a buyer and seller. The prices are published only with a view to giving some ideas of the market conditions.

The prices are inclusive of Excise and Maharashtra Sales Tax.

(Prices as on May 7, 1990)

INDUSTRIAL CHEMICALS	Per Kg.
Ammonium sulphate	2.50
Ammonium phosphate (Mono)	14.50
Ammonium phosphate (Di)	14.50
Ammonium carbonate (Di)	17.00
Ammonium bicarbonate	6.00
Ammonium chloride	3.25
Ammonium nitrate	6.00
Arsenic white powder	22+ST
Acrylamide (Resale)	72.00
Barium carbonate	13.00
Bleaching powder (33% Cl)	5.00
Borax (Granular)	17.50
Borax (Powder)	22.00
Boric acid (Tech)	26.00
Bisphenol-A	82.00
Butyl carbitol	110.00
Caustic soda (Flakes)	12.00
Caustic soda (Solid)	12.00
Caustic soda (Lye)	10.00
Calcium chloride 70% (Solid)	3.25
Calcium chloride 75-80%(fused)	3.50
Calcium chloride 36% (Anhydrous)	5.00
Calcium carbonate (precipitated)	6.00
Calcium carbonate (Activated)	5.75
Cobalt oxide	300.00
Cresylic acid	62.00
Camphor (Indian)	105.00
Cream of Tartar (Tech.) China	70.00
Citric acid (Belgium) (Resale)	47.00
Citric acid (Indian) (Resale)	44.00
Copper sulphate	26.00
Chromic acid	63.00
Ethylene urea	58.00
Ferric chloride (Lumps)	5.50
Ferric chloride (Anhydrous)	16.00
Glue flakes	15.00
Glue sheets	6.75
Gohsenol GH-17	128.00
Hydro	39+ST

FOR YOUR REQUIREMENT OF

PARA CHLORO PHENOL
ORTHO CHLORO PHENOL
MONO CHLORO PHENOL
DICHLORO PHENE
SULFURYL CHLORIDE
TRI N-BUTYL PHOSPHATE
OCTYL ACETATE
BUTYL ACETATE
CAUSTIC POTASH FLAKES
POTASSIUM CARBONATE
MONOETHANOLAMINE
DIETHANOLAMINE
TRIETHANOLAMINE
NORMAL BUTYL BROMIDE

Authorised Dealer of

M/s. Standard Alkali,
M/s. Anupam Rasayan,
M/s. Odex Chemicals Pvt. Ltd.,
M/s. P.K. Velu & Co. Pvt. Ltd.,

Please Contact:

Shree Amruta Organics Pvt. Ltd.

813, Raheja Centre, 214, Nariman Point, Bombay 400 021.
Phone: 240415, 243979, 2873680 **Telex: 11 6053 SATC**
4A-B, Trade Centre, Near Stadium House,
Ahmedabad 380 014.
Telephone: 462332

Hyflosupercell	24.00
Hexamine (Resale)	36.00
Industrial Wax	25.00
Litharge	40.00
Lead Acetate (Tech.)	39.00
Lithopone	19.00
Magnesium chloride (Crystal)	2.00
Menthol crystal (Flakes)	355+Ex+ST
Menthol bold	425+Ex+ST
Menthol crystal cold	395+Ex+ST
Magnesium carbonate (Japan)	30.00
Magnesium carbonate (Indian)	26.00
Maleic Anhydride (Resale)	35.00
Mercury (34.5 Kgs)	11,500.00
Nickel chloride	110.00
Oxalic acid (Resale)	15.50
Peppermint oil (Rectified)	188+Ex+ST
Potassium carbonate (Indian)	26.00
Potassium carbonate (Imported)	36.00
Potassium bichromate	33.00
Potassium phosphate (Mono)	34.00
Potassium phosphate (Di)	25.00
Polyvinyl alcohol (No. 117)	125.00
Polyvinyl alcohol (No. 173)	125.00
Polyvinyl alcohol (No. 208)	150.00
Paraformaldehyde (Resale)	22.00
Phthalic anhydride 36% (Resale)	26.50
Pentaerythritol (Resale)	49.00
Paraffin wax	22+ST
Rangolite (German)	96+ST
Rangolite (Czech.)	73.00
Rangolite (China)	58.00
Sodium sulphate (Fine)	3.75
Sodium sulphate (Coarse)	3.50
Sodium sulphide 50-52% (Flakes)	11.50+ST
Sodium sulphide 58-60% (Flakes) (TCL)	25.00
Sodium sulphide pure (Flakes)	12.25
Sodium nitrite (Resale) per 50 kg.	1,300.00
Sodium chlorite 80% (Spain)	102+ST
Soda Ash (Tata)	4.90
Soda Ash (Birla)	4.30
Soda Ash (Imp.)	4.50
Sodium bicarbonate	7.00
Sodium bisulphite	8.00
Sodium silicate	5.50
Sodium acetate	7.20
Sodium alginate	450.00
Titanium Dioxide (Anatase)	78.00
Titanium Dioxide (Rutile – RCR_2)	92+ST
Tartaric acid	150.00
Trisodium phosphate	12.00
Thiourea	83.00
Urea (Tech.)	3.00
Vacuum salt	1.00
Zinc Dust	52.00
Zinc Oxide	57.00
Zinc chloride powder (Tech.)	20.50
Zinc sulphate	7.00

SOLVENTS	Per Kg.
Acetic Acid Glacial (Resale)	13.00
Acetic Anhydride (Resale)	35.00
Acetone (Resale)	17.00
Adipic Acid	90.00
Aceto Acetanilide	55.00
Aniline Oil	48.00
Benzoate Plasticiser	62.00
Butyl acrylate	80+ST
Butyl stearate	38.00
Butanol	32.00
Benzyl Alcohol	60.00
Benzyl Chloride	34.00
Benzo trichloride	16.00
Benzoyl chloride	22.00
Bromine Liquid	65.00
Chloroform	27.00
Carbon Tetrachloride	19.50
Cellosolve	58.00
Cyclohexanone	57.00
Cyclohexanol	58+ST
Diacetone (Resale)	27.50
Diethyl Oxalate	34.00
Diethyl glycol (DEG)	27+ST
Dioctyl Phthalate	44.00
Diallyl Phthalate	41.00
Dimethyl Phthalate	28.00
Dioctyl Adipate	52.00
Dibutyl Adipate	42.00
Dipentene	15.00
Dimethylamine 40%	30.00
Dimethylamine 50%	35.00
Ethyl Acetate	15.50
Ethyl Acrylate	72.00
Ethylene Dichloride	16.00
Ethylene Glycol	13.00
Formic Acid (Imp.)	23.00
Formaldehyde (Resale)	7.50
Glycerine (CP)	55.00
Glycerine (IW)	54.00
Hydrogen Peroxide 50% (Resale)	32.00
Isopropyl Alcohol	33.00
Isobutyl Alcohol (Resale)	35.00
Monoethanolamine (Resale)	90.00
Melamine	69.00
Methyl Ethyl Ketone	32.00
Methyl Isobutyl Ketone	42.00
Methyl Acrylate	66.00
Methylene Dichloride (Resale)	16.00

H-ACID

OF INTERNATIONAL STANDARD
FROM

SHREE HARI CHEMICALS (INDIA) PVT. LTD.

CATERING TO THE NEEDS OF DOMESTIC & EXPORT MARKETS EFFICIENTLY

Bombay Office: Amrit Niwas, 3rd Floor, 159/2, Cavel Cross Lane No. 6,
Kalbadevi, Bombay 400 002.
Phones: 292081/258697 **Telex:** 011-5394 ANUJ IN (SHC)
Works: A/8, M.I.D.C., Mahad, Distt. Raigad.
Phone: 2711/2713

IN GOD WE TRUST

For Excellent Quality & Regular Guaranteed Supplies at Competitive Rates:

CALCIUM STEARATE
MAGNESIUM STEARATE BP 80
ZINC STEARATE
ALUMINIUM STEARATE
COPPER SULPHATE IP
DRIED ALUMINIUM HYDROXIDE IP
MAGNESIUM HYDROXIDE POWDER IP
ZINC CARBONATE
AND OTHER LABORATORY CHEMICALS

Contact Manufacturers & Exporters:

ARUN INDUSTRIES

303-A, Vrindavan, Ramachandra Lane, Malad (West), Bombay-400 064.
Phone: Office: 6820559/6820422 Telex: 011-78081 ARUN IN
Gram: "DEVOTION"

WE ARE REGISTERED WITH D.G.S. & D

For Your Requirements of:

1. Sodium Naphthionate
2. Acrylic Dyes
3. Disperse Dyes
4. Bulk Drugs
5. Flavouring Essences
6. Sodium Sulphite Pure

Contact:

Gohil Dyechem Corporation
Gohil Chemicals

Anand, 82/84,
Kazi Sayed Street,
2nd Floor,
Bombay 400 003.
Tel. No.: 346191/339450/324515
Gram: GOHIL CHEM

ETHYL CELLOSOLVE
ETHYL CARBITOL
1:5 NAPTHALENE DI-SULPHONIC ACID
(ARMSTRONG ACID)
*TRICRESYL PHOSPHATE * CELLOSOLVE ACETATE*
*BENZYL ACETATE FFC * BENZYL ALCOHOL FFC*

For Your Requirement Please Contact:

trade link

5/363, Mangaldas Building, Trikamji Ghia Marg, 2nd Floor, BOMBAY - 400 002.
Phone: 297718/259487; Resi.: 4073310 Gram: 'POLOSIGHT' Telex: 4258 PTK IN

Carbitol	64+ST
Meta Cresol	45.00
Nitrobenzene	19.00
Nitric Acid (Conc.) (RCF)	2.50
Ortho Cresol	30+ST
Phenol (Resale)	35.00
Propylene Glycol	45.00
Polyethylene Glycol (No.200)	9.00
Polyethylene Glycol (No.400)	60.00
Polyethylene Glycol (No.500)	52.00
Polyethylene Glycol (No.1600)	54.00
Polyethylene Glycol (No.4000)	80.00
Polyethylene Glycol (No.6000)	85.00
Para Cresol	110.00
Styrene Monomer	45.00
Sorbitol	14.00
Sulphuric Acid	2.80
Trichloroethylene	28.00
Triethanolamine (Resale)	88.00
Turpentine Oil (Germany)	8.00
Turkey Red Oil (50%)	20.00
Vinyl Acetate Monomer	52.00

SOLVENTS	Per Litre
Benzene	11.00
N-Heptane	10.50
N-Hexane	12.50
Methanol	9.00
Solvent Naphtha Heavy	10.50
Solvent Naphtha Light	8.50
Toluene	11.00
Xylene	22.00

DYES INTERMEDIATES (PRICES ARE WITHOUT TAX AND EXCISE)

Alphanaphthylamine	65.00
Alpha Naphthol (Imp.)	165.00
Aceto Acetic Ester (Methyl)	70.00
Ammonium Molybdate	210.00
Anthraquinone	120.00
Anthranilic Acid	70.00
2-Amino 4-Nitrophenol	140.00
Blue B. Base (Local)	365.00
Beta Naphthol (Atul)	75.00
Benzidine Dihydrochloride (BDH)	92.00
Bromamine Acid	550.00
BON Acid (Incl. of excise)	124.00
Chicago Acid (Atul)	157.00
Coach Acid	52.00
C. Acid (Imp.)	210.00
Cyanuric Chloride	142.00
2,4- DNCB	29.00
Dihydrothio PTOS (Imp.)	1,000.00
Dimethyl Aniline	65.00
Diethyl Aniline	150.00
Diamino stilbene disulphonic acid	155.00
3,3-DCB (Imp.)	175.00
Gamma Acid (Atul)	205.00
H. Acid (Atul)	105.00
G. Salt	73.00
Isophthalic Acid	45.00
J. Acid	330.00
J. Acid Urea	380.00
K. Acid	115.00
MPDS (German)	185.00
MNA	160.00
Meta Ureido Aniline	160.00
MPD (Local)	200.00
MPD (Japan)	25.00
Naphthenic Acid	510.00
N-Methyl J. Acid	125.00
N-Methyl Aniline	23.00
Naphthalene (Refined)	110.00
Ortho Anisidine (OA) (Imp.)	20.00
Ortho Dichloro Benzene (ODCB)	125.00
OT Base	28.00
Para Dichloro Benzene (PDCB)	160.00
Para Anisidine (PA local)	110.00
PNA	410.00
Para Cresidine (Imp.)	150.00
Para Amino Azo Benzene (India)	55.00
PNCB	190.00
Para Amino Acetanilide	145.00
1-Phenyl 3-Methyl 5-Pyrazolone	360.00
Phenyl J. Acid	165.00
Para Amino Benzoic Acid	140.00
PT Base	550.00
Rhoduline Acid	28.00
Resist Salt 80%	210.00
Resorcinol	65.00
Sodium Naphthionate	80.00
5-Sulpho-Anthranilic Acid	33.00
Sulphanilic Acid	145.00
Sulpho Tobias Acid	24.00
Trichloro Benzene (TCB)	150.00
Tobias Acid	45.00
Metanilic Acid	130.00
MTD	

We Manufacture Chemicals For Industrial Use

- Acetic Acid
- Acetic Anhydride
- Acetaldehide
- Industrial Alcohol
- Monochloro Acetic Acid
- Ethyl Acetate
- Butyl Acetate
- E D T A
- N T A
- Carboxy Methyl Cellulose

ASHOK ORGANIC INDUSTRIES LTD.

406,Sharda Chambers, 33,Sir Vithaldas Thackersey Marg (New Marine Lines),Bombay-400 20
Phone : 252236 : 252256 : 317511 Gram : 'ASHOKBROS' Telex : 11-3853 AOIL IN

Also Please Contact:

Baroda : Phones : 324519-325769
Telex : 0175-597 AOIL IN
Ahmedabad : Phone : 78009
Ankleshwar : Phone : 2461-2462
Telex : 0189-238 AOIL IN

New Delhi : Phones : 5710733-5711057
Calcutta : Phones : 282474-282475
Telex : 021-7917 SBIL IN
Madras : Phone 582046
Telex : 041-7527 SBIL IN

Bangalore : Phones 570746-570760
Telex : 0845-8275 SBIL IN
Hyderabad : Phones 73737-831049
Poona : Phone 50797

Plants at : Nandesari - Baroda, GIDC Ankleshwar; Boridra - Bharuch

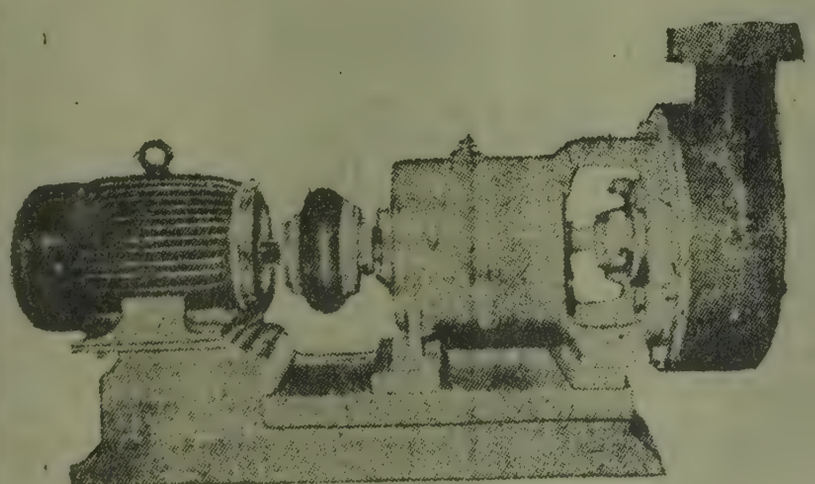
KNOW HOW: PARACETAMOL IP (500 Kgs/Day)

COMPLETE KNOW HOW WITH GUARANTEED RESULTS AVAILABLE. TOTAL PROJECT COST AROUND Rs. 50,00,000. GENUINE PARTIES WITH SOUND FINANCIAL BACKGROUND WILLING TO START PLEASE CONTACT FOR DETAILS:

BOX NO. 183

CHEMICAL WEEKLY
Room No. 9, Wellingdon Estate,
3rd Floor, 24, Commander-in-Chief Road,
Madras 600 105.

FIRST TIME IN INDIA



CORROSION RESISTANT SILICA-EPOXY MOULDED CENTRIFUGAL PUMPS

For PUMPING HIGHLY CORROSIVE CHEMICALS

* **Maximum Temperature 130°C.**
* **Maximum Head 30 Metres**
* **Capacity 1-10 lit/Sec.**
* **Gland Packing/Mechanical Seal.**

For details contact:

RESICAST

Gafoor Khan Estate, Gala No. 6, Opp. Kurla Bus Depot, Kurla, Bombay 400 070. **Phone: 5141312/6490332**

Raw Material Available with MODVAT benefits from Ready Stock/Incoming consignment

ACRYLAMIDE	CUPROUS OXIDE	PARAFORMALDEHYDE
ACRYLIC ACID	D.C.D.A.	PERCHLOROETHYLENE
ADIPIC ACID	EPICHLOROHYDRINE	POTASSIUM FERRO-CYANIDE
BISPHENOL-A	FURFURYL ALCOHOL	PROPIONIC ACID
BORAX	ISOPHTHALIC ACID	PROPYLENE GLYCOL DOW
BORIC ACID	MALEIC ANHYDRIDE	THIOUREA
BROMINE LIQUID	MELAMINE	TRICHLOROETHYLENE
BUTYL CELLOSOLVE	NAPHTHALENE CRUDE	
CELLOSOLVE	OCTOIC ACID	

Please Contact:

J. KIRIT & BROTHERS

Gulabi House, 3rd Floor, 111/115, Kazi Sayed Street, Bombay 400 003.
Phones: 329881, 347358, 349803 **Resl.:** 6127133, 6147099
Telex: 011-71322 JKB-IN **Cable:** "JEKIRIT"

Bombay Dyes Market

(Prices as on May 7, 1990)

ACID COLOURS	Per Kg.
Acid Violet 4BS	*190.00
Acid Maroon V	110.00
Acid Orange II	112.55
Acid Orange IIY	93.85
Acid Red A	137.00
Acid Scarlet 3R	128.35
Acid Red 3BN	*195.00
Acid Red R2R	132.00
Acid Red RS	88.00
Acid Patent Blue AS	*280.00
Acid Green V	*375.00
Acid Coomasi Blue	200.00
Acid Yellow 5GN	65.00
Acid Red PG	85.00
Acid Red GRS	78.00
Acid Black 10 BX	157.15
Acid Black BX	126.95
Acid Black Wax	135.50
Crosein Scarlet MOO	200.30
Procinil Yellow GS (ICI, UK)	265.00
Procinil Red GS (ICI, UK)	530.00
Procinil Blue RS (ICI, UK)	315.00
Procinil Scarlet G (ICI, UK)	600.00
Procinil Orange G (ICI, UK)	250.00
Procinil Rubine (ICI, UK)	550.00

* To get resale price add 6% tax.

DIRECT COLOURS	Per Kg.
Yellow 3GX	114.00
Gun Yellow RCH	175 85
Fast Yellow GCH	171.50
Yellow CFG Hly. Conc.	721.00
Fast Yellow GS	126 96
Fast Yellow CHRS	116.85
Viscose Orange A	210.35
Fast Orange GR	171.50
Red	122.65
Dark Tan	98.15
Red IIR	98.15
Red 4B	217.55
Bordeaux BW	170.10
Fast Scarlet 4BS	223 50
Red 12B	220.45
Bordeaux Hly. Conc	249.20
Cotton Red N	117.05
Brill. Fast Helio B	362.85
Brill. Fast Helio 2R	385 85
Brill. Fast Helio 2RS	177.30
Brill. Fast Helio BS	116.10
Brill. Violet Extra	181.45
Blue 2B	102.50
Blue G	220.45
Sky Blue FB	242.00
Copper Blue GR	190.25
Fast Greenish Blue GL	114.60
Developed Black BT	149.95
Blue NB-2B	348.45
Blue NB-2BG	214.70
Developed Black NB-GHB	214.70
Green B	142.75
Green NB-B	218.90
Green 2B-N	218.90
Brown MR	197.40
Brown CN	137.00
Golden Brown G	175.85
Catechin G	155.70
Omega Tan	161.45
Catechin GS	102.80
Black E Hly. Conc.	180.15
Black E Extra Hly. Conc.	180.15
Black NB-ER Hly. Conc.	290.50

DISPERSOL COLOURS	Per Kg.
Red B 3B Conc	611.50
Red B 2B Conc	797.90
Red CB Powder	1048.25
Red D2B Powder	599.85
Violet C 4R Conc.	1202.70
Blue BG Conc	580 65
Blue BN Powder	128 20
Blue D 2R Powder	586 25
Navy BT Conc	531 95
Blue B 2G Conc	577 95
Black BT Conc	319 50
Blue BR	482 40
Yellow 7GL	813 20
Yellow 5RX	269 90
Yellow 3G	473 20
Yellow	140 00
Yellow AL	167 20
Yellow Brown REL	311 70
Yellow FFL	571 40
Gold Yellow GG	320 80
Pink REL	593 00
Red BEL	615 60
Red 2B	422 40
Red FB	425 80
Red Violet FBL	622 00
Orange 3R	254 20
Violet 3R	370 50
Violet RL	355 70
Violet 6R	638 20
Scarlet RR	283 50
Rubine 3B	289 10
Rubine CB	449 50
Blue GL	419 00
Blue BGF	805 80
Navy Blue RE	359 90
Brown 3REL	272 80
Black GEL	420 10
Dark Brown 3B	411 10

BASE COLOURS	Per Kg.
Fast Yellow GC	77.75
Fast Orange GC	128 40
Fast Scarlet R	198 05
Fast Scarlet RC	128 40
Fast Scarlet RCR	105 60
Fast Scarlet G	115 75
Fast Scarlet GN	92 95
Fast Scarlet GG	77 75
Fast Scarlet GGS	73 95
Fast Red B	233 50
Fast Red RC	115 75
Fast Red R Flakes	158 80
Fast Red TR	181 60
Fast Red TR Oil	223 35
Fast Red RL	251 20
Fast Red KB Oil	251 20
Fast Bordeaux GP	236 00
Fast Garnet GBC	103 05
Fast Violet B	548 80
Fast Blue BB	566 50

NAPHTHOL COLOURS	Per Kg
ASG	301 85
AS	205 65
ASSW	339 10
ASBS	253 75
ASBO	246 40
ASD	209 45
ASOL	243 85

* ACTIVATED ALUMINA BALLS & GRANULAR
* MOLECULAR SIEVES TYPE 3A, 4A, 5A, & 13X
* ACTIVATED CARBON GRANULAR
* SILICA GEL WHITE & BLUE IN ANY MESH
* SILICA GEL IN FABRIC BAGS FROM 0.5 gm TO 1 kg.
* PRECIOUS METAL CATALYSTS & SALTS LIKE Pd, Pt, etc.

Please Contact:

R. V. CORPORATION

9, UTTAM CHAMBERS, 39, SYED MURI STREET, BOMBAY 400 009
PHONE: 325440 GRAM: "AMARJYOT"

For Your Requirements Of:

BON ACID * BETA NAPHTHOL
SODIUM SULPHITE (Crude)

Contact Manufacturers

MULTI ORGANICS PRIVATE LIMITED

K-208, Keshava Bldg., 2nd Floor, Bandra-Kurla Commercial Complex,
Behind Drive-in-Theatre, Bandra (E), Bombay-400 051.
Phone Nos.: 6407778/6424736 Gram: MULTIORG, Bombay-51
Telex: 011-74530 MOL IN

Factory: A-1, MIDC Industrial Area, Chandrapur-442 401 (M.S.).
Phone: 7-54 Telex: 716-213 MORG-IN

NOW READILY AVAILABLE

NITROBENZENE

PROPYLENE GLYCOL
ISO PROPYL ALCOHOL
TONSIL OPTIMUM
HYFLOSUPERCELL
HYDRAZINE HYDRATE
MONO ETHYLENE GLYCOL
METHYL ETHYL KETONE
PHENOL, ACETONE

Please Contact:

HORIZON CHEMICALS

Regd. Office: 41/42, Dharam Jyot-2, Off Perry Road, Bandra, Bombay 400 050.
Sales Office: 7/2, Rang Mahal, 212/216, Samuel Street, Bombay 400 003.
Phones: Off.: 329000, 333200,346437 Resi.: 6407001, 6409052 Telex: 011-76799 SACH IN

ASTR	369.00
ASPH	336.05
ASE	236.00
ASEL	249.95
ASLB	2002.35
ASBT	2459.45
ASWG	143.00
ASSG	538.65
ASSR	652.60

PROCION COLOURS	Per Kg.
Golden Yellow HR	207.95
Brill. Yellow H4G	145.65
Supra Yellow H-8GP	168.55
Brill. Yellow HE6G	214.75
Yellow G-E4R	276.05
Brill. Yellow H7G	332.30
Yellow M4R	275.45
Yellow MGR	387.65
Brill. Yellow M4G	201.15
Brill. Yellow M8G	366.10
Yellow M3R	244.70
Brill. Orange H2R	303.80
Brill. Red H7B	157.95
Brill. Orange M2R	313.15
Brill. Red H8B	213.55
Brill. Scarlet H RN	245.05
Supra Red H-3BP	179.80
Brill. Red H-F3B	243.45
Brill. Magenta HB	182.00
Brill. Red M 5B	160.05
Brill. Red M 8B	218.35
Brill. Pink MB	137.10
Brill. Magenta MB	163.65
Brill. Purple H-3R	219.55
Brill. Purple H-7R	175.40
Navy Blue H 3R	333.75
Brill. Blue H-GR	406.40
Brill. Blue H5G	207.95
Blue H 5RX	286.20
Brill. Blue H 7G	213.95
Brill. Blue H 7RX	358.15
Turquoise HA	265.05
Supra Blue H-3RP	595.30
Supra Turquoise H 2G P	181.50
Blue H-FRD	305.80
Navy Blue H3R	333.75
Blue H 5RX	286.20
Navy Blue M3R	355.70
Brill. Blue MR	405.60
Brill. Blue M RX	214.20
Brill. Blue M-G	226.45
Blue M 4GD	369.40
Navy Blue M RB	341.85
Turquoise M-G	240.30
Brill. Blue M GX	516.25
Blue 3R Acra Powder	718.20
Dark Brown H 6R	248.45
Cobalt Oxide	285.00
Green H4BD	287.00
Green H-E4BI	169.80
Red Brown H IF	143.25
Orange Brown H 28	209.05
Brown M GRN	188.80
Black H-N	314.20

SULPHUR COLOURS	Per Kg.
Navy Blue	210.35
Green G	194.55
Black Grains Extra	72.25
Black Grains OG	73.70
Black GXE Conc.	70.85
Black GXE	57.90
Black GXR	69.40
Black Grains 800	62.80
Black EXR Grains	73.70
Black EXR Grains 800	59.35

VAT COLOURS (ICI)	Per Kg.
Yellow 5G Supra Disperse	561.85
Yellow 5G Acra Conc	818.60
Gold Orange 3G Pdr. Fine	1158.45
Brill. Orange 6R Pdr. Fine	624.35
Gold Orange 3G Supra Disp	693.85
Brill. Orange 6RX Powder	394.30
Brill. Red 3B Pdr. Fine	1214.15
Brill. Red 3B Supra Disp	867.45
Brill. Purple 3R Acra Powder	827.05
Brill. Purple 2R Hly Conc.	744.25
Brill. Purple 4R Supra Disp.	604.25
Brill. Purple 2R Acra Conc.	779.85
Blue 2R Powder Fine	675.30
Blue BC Acra Con Pdr. Fine	1013.15
Blue BC Conc. Pdr. Fine	713.65
Blue R Conc. Pdr. Fine	719.70
Blue Conc. Powder	645.80
Brill. Blue 2R Hly. Conc.	378.55
Blue RR Supra Powder	629.35
Brill. Blue 2R Supra Disp.	115.65
Dark Blue 2R Powder Fine	512.65
Blue BC Supra Disp.	419.65
Jade Green XBN Powder Fine	555.80
Jade Green XBN Acra Conc. Pdr	1026.05
Jade Green 2G Pdr. Fine	533.25
Jade Green 2G Ptg. Paste	125.40
Jade Green XBN Ptg. Paste	126.00
Jade Green 2G Supra Disp.	618.00
Olive D Pdr. Fine	563.90
Olive Green B Supra Disp.	421.70
Jade Green XBN Supra Disp. (N)	327.30
Olive OMW Powder Fine	698.55
Olive OMW Supra Disp.	538.05
Olive D Supra Disp.	361.70
Olive R Supra Disp.	470.25
Olive D. Ptg. Paste	193.00
Olive Green B Ptg. Paste	199.10
Olive Green B Acra Conc.	741.10
Olive R Acra Conc.	779.85
Brown R Pdr. Fine	869.45
Dark Brown 3R Fine	826.25
Brown G Supra Disp.	582.05
Brown 2G Supra Disp.	716.10
Brown R Supra Disp.	547.35
Brown BR Powder	867.75
Dark Brown 3R Ptg Paste	217.15
Dark Brown 3R Supra Disp	529.60
Brown G Acra Conc.	967.95
Brown M. Powder Fine	768.80
Grey M. Supra Disp.	585.45
Blue BC Acra Conc. Pdr. Fine	762.70
Direct Black AC Supra Disp.	415.75
Direct Black AC Pdr. Fine	574.70
Direct Black CH Supra Disp.	490.45
Direct ACD Ptg Paste	217.15

Bombay Drugs Market

Prices as on May 5, 1990

Product	Rs./kg.	Product	Rs./kg.	Product	Rs./kg.
Acetazolamide IP	700.00	Di-iodohydroxyquinoline	560.00	Methyl Chloroformate	65.00
Acriflavine BPC	850.00	Diloxanide Fumarate IP	370.00	Metronidazole IP	450.00
Aluminium Hydroxide IP	36.00	Diphenhydramine HCl	280.00	Morpholine	120.00
Ampicillin Trihydrate	1550.00	Disodium Hydrogen Citrate	80.00	Niacinamide	310.00
Aminophylline	335.00	Ephedrine HCl	1900.00	Nifedipine	1100.00
Albendazole	2300.00	Erythromycin Stearate	2075.00	Nitrofurazole	280.00
Analgin	250.00	Ethambutol IP	925.00	Oxyphenbutazone	585.00
Aspirin IP	85.00	Ferrous Fumarate	40.00	Paracetamol	160.00
Atenolol	3000.00	Folic Acid IP	3500.00	Pectin IP	480.00
Benzoic Acid IP	35.00	Furosemide IP	1900.00	Pepsin 1:3000	300.00
Bromhexine HCl	2400.00	Furazolidone IP	355.00	Phenbarbitone	510.00
Caffeine Citrate IP	350.00	Guanidine Nitrate	40.00	Pheniramine Maleate	925.00
Caffeine IP	320.00	Gallic Acid	300.00	Phenyl Butazone USP	600.00
Calcium Gluconate IP	48.00	Haloperidone	19,000.00	Piperazine Citrate	85.00
Calcium Glycerophosphate	160.00	Hematropine Methyl Bromide	9.25	Potato Starch	65.00
Calcium Lactate	40.00	Hydrazine Hydrate	83.00	Propranolol HCl	1025.00
Calcium Phenthonate	600.00	Ibuprofen IP	385.00	Saccharine Sodium	230.00
Cetrimide IP	200.00	I.N.H.	260.00	Salbutamol Sulphate	7600.00
Chloramphenicol Powder	1400.00	Inosite IP	925.00	Sodium Iodide	385.00
Chlorbutol	95.00	Iodochloro	490.00	Sodium Methoxide	96.00
Chlorhexidine Gluconate 20% BP	210.00	Lactose IP	37.00	Sorbitol Powder	115.00
Chloroquin Phosphate	875.00	Lactic Acid	90.00	Sorbitol USP	13.00
Chlorpromazine HCl	1550.00	Lignocaine HCl	325.00	Sulphacetamide	300.00
Choline Chloride FG	30.00	Lignocaine Base	325.00	Sulphamethoxazole	285.00
Choline Chloride IP	55.00	L. Lycine Feed	140.00	Tinidazole	340.00
Citric Acid IP	40.00	L. Lysine Pharma	250.00	Theophylline Anh.	400.00
C.P. Maleate IP	1150.00	Magaldrate IP	46.00	Trimethoprim IP	1090.00
Dapson IP	280.00	Magnesium Hydroxide	22.00	Vitamin B6 Hydrochloride	1400.00
D.C. Citrate	265.00	Magnesium Trisilicate IP	10.50	Vitamin B2 5-Phosphate	4300.00
Dexamethasone	90.00	Mannitol USP	100.00	Vitamin C Plain	285.00
Dicyclomine HCl	1550.00	Mebendazole	610.00	Vitamin C Coated	290.00
Diethyl Carbamazine Citrate	250.00	Mercurochrome NF	280.00	Vitamin K3 W/S	675.00

Read & Subscribe

to

CHEMICAL WEEKLY

&

TEXTILE DYER & PRINTER

Madras Market

The downward trend in prices which started last week is continuing and especially prices of solvents are dropping on better availability. Caustic supply position has improved vastly. With the commencement of production, Tuticorin Alkali Chemicals prices of soda ash has started coming down, though TAC's production is yet to reach the market. Similarly, prices of Hydros have marked a downward fall due to better availability and lower consumption. In the solvents, prices of toluene, benzene, ethyl acetate, diethylene glycol have all crashed to lower levels due to higher production and better availability.

(MADRAS MARKET RATES AS ON MAY 5, 1990)

Acetic Acid Glacial (per kg)	14.50
Aluminium Sulphate Iron free (per MT)	3,500.00
Ammonium Bicarbonate (per 25 kgs)	150.00
Ammonium Chloride (per MT)	3,000.00
Acid Slurry (per kg)	31.50
Barium Carbonate (per kg)	9.00
Barium Chloride (per kg)	8.00
Boric Acid Technical (per kg)	26.00
Bleaching Powder (per 50 kgs)	225.00
Borax (per 50 kgs)	785.00
Caustic Soda Flakes -- Mettur Chemicals (per MT)	11,800.00
Caustic Soda Flakes -- Andhra Sugars (per MT)	11,800.00
Calcium Chloride 70% Solid (per MT)	3,500.00
Calcium Chloride Anhydrous (per MT)	5,750.00
Calcium Carbonate (Activated) (per MT)	6,250.00
Calcium Carbonate (Precipitated) (per MT)	5,250.00
Citric Acid (per kg)	48.00
Copper Sulphate (per kg)	24.00
Cresylic Acid 98-99% (per kg)	130.00
Pure Para Cresol 96% (per kg)	85.00
Meta Para Cresol 42% (per kg)	50.00
Formic Acid (per kg)	26.00
Formaldehyde (per kg)	8.00
Glue Flakes (per kg)	15.00
Glycerine I.W. (per kg)	50.00
Hydrosulphite of Soda (TCPL) (per kg)	36.00
Hydrosulphite of Soda (IDI) (per kg)	40.00
Hydrosulphite of Soda (BASF) (per kg)	40.00
Hexamine (per kg)	31.00
Hyflosupercell (per kg)	19.50
Hydrogen Peroxide (per kg)	31.50
Litharge (per kg)	40.00
Lead Acetate (per kg)	38.00
Magnesium Carbonate (per kg)	18.00
Magnesium Chloride (per kg)	3.50
Maleic Anhydride (per kg)	40.00
Menthol Crystals (per kg)	350.00
Oxalic Acid (per kg)	18.00
Paraffin Wax (per kg)	17.00
Potassium Bichromate (per kg)	36.00
Phosphoric Acid (per kg)	28.00
Polyvinyl Alcohol Powder (per kg)	125.00
Pentaerythritol (per kg)	50.00
Phthalic Anhydride (per kg)	30.00
Soda Ash (TAC) (per 75 kgs)	425.00
Soda Ash (TATA) (per 75 kgs)	425.00
Sodium Bicarbonate (TATA) (per 50 kgs)	385.00
Sodium Silicate (per MT)	3,500.00
Sodium Bichromate (per kg)	28.00
Sodium Nitrate (per kg)	8.00
Sodium Nitrite (per kg)	15.00
Sodium Sulphide Flakes (per kg)	14.00
Sodium Bisulphite (per kg)	8.00
Sodium Alginate (per kg)	275.00
Sodium Acetate (per kg)	7.00
Sodium Sulphate (Anhydrous) (per kg)	3.50
Titanium Dioxide (Anatase) (per kg)	65.00
Titanium Dioxide (Rutile) (per kg)	85.00
Trisodium Phosphate (per kg)	13.00
Urea (Technical) (per kg)	3.00
Zinc Oxide (per kg)	50.00
Zinc Chloride Powder (per kg)	12.50
Zinc Sulphate (per kg)	8.00

SOLVENTS

Acetone -- HOCL (per kg)	18.00
Butanol (per kg)	35.00
Butyl Acetate (per kg)	38.00
Benzene (per lit)	14.00
Cellosolve (per kg)	60.00
Carbon Tetra Chloride (per kg)	21.00
Chloroform (per kg)	30.00
Diacetone Alcohol (per kg)	30.00
Diethylene Glycol (per kg)	28.00
Dichloroethane (per kg)	18.00
Di-octyl Phthalate (per kg)	46.00
Di-N-butyl Phthalate (per kg)	46.00
Ethyl Acetate (per kg)	18.00
Isopropyl Alcohol (per kg)	28.75
Methanol (per kg)	10.00
Methylene Chloride (per kg)	21.00
Methyl Ethyl Ketone (per kg)	34.00
Methyl Isobutyl Ketone (per kg)	41.00
Phenol (per kg)	38.00
Sorbitol (per kg)	15.00
Triethanolamine (per kg)	90.00
Trichloroethylene (per kg)	27.00
1-1-1 Trichloroethane (per kg)	29.00
Turpentine (per lit)	16.00
Toluene (per lit)	13.00
Xylene (per lit)	21.00

Shipping News

VESSELS DUE IN BOMBAY FOR EXPORT LOADING

Due Date (1)	Steamer's Name & Flag (2)	Agents (3)	Will load for (4)	Approx. sailing dt. (5)
15/5	Maersk Clementine	Volkart Fleming	Leghorn; Marseilles; Naples; Barcelona; Bilbao; Bordeaux; Alicante; Genoa; Valencia; Bremen; Jeddah; Antwerp; Rotterdam; Bremerhaven; Hamburg; U.K. and Scandinavian ports. (Carting at M.O.D. No. 3).	20/5
12/5	Eagle Breeze	F.F.C. Co.	Jeddah; P. Sudan; Hodeidah. (Carting at Timber Pond No. 1).	18/5
13/5	Seacrest Achiever (Voy-213)	Merzario/	Jeddah; Hodeidah; P. Sudan; Ravenna; Ancona; Piraeus; Venice; Trieste. (Carting at M.O.D. No. 1).	19/5
		Seaspeed/	Tilbury; London; Felixstowe; Manchester; Liverpool; Avonmouth; Le Havre; Rotterdam; Hamburg; Antwerp; Bremerhaven and Scandinavian ports. (Carting at M-178 Cotton Depot).	
		L. Triest/	Jeddah; Trieste; Venice; Ravenna; Rijeka; Naples. (Carting at M-171/173 Cotton Depot).	
		U.L.A.	P. Sudan; Aden; Djibouti; Hodeidah. (Carting at E-Grain Depot).	
		Killick/	Jeddah; Felixstowe; London; Liverpool; Manchester; Bristol; Avonmouth; Leeds; Glasgow; Tilbury; Birmingham; Dublin; Belfast; Rotterdam; Hamburg; Le Havre; Antwerp; Bremen; Bremerhaven; Fos; Valencia; Marseilles; Barcelona and Scandinavian ports. (Carting at E-Shed Grain Depot).	
		S.W.& Co./ Trident/ P & O	Tilbury; London; Felixstowe; Avonmouth; Manchester; Liverpool; Glasgow; Leeds; Birmingham; Dublin; Belfast; Bristol; Marseilles; Genoa; Barcelona; Le Havre; Antwerp; Rotterdam; Hamburg; Bremerhaven; Copenhagen; Oslo; Helsinki; Malmao; Gothenburg; Stockholm; Aarhus; Alborg. (Carting at Timber Pond No. 4 for S.W. & Co., Trident & P&O).	
10/5	Arab Mazin (Saudi).	Depe	Jeddah; Aden. (Carting at 5-VD)	20/5
12/5	Paithoon	Kanika	Antwerp; Rotterdam; Hamburg; Le Havre; Genoa; Gothenburg; Stockholm; Copenhagen; Oslo; Helsinki; London; Felixstowe; Tilbury. (Carting at T.P. No. 3).	16/5
12/5	Orient Express (Voy-114)	Transworld	Hodeidah; Djibouti; Port Sudan; Jeddah; Assab; Masawa; La Spezia; Naples; Malta; Beira; Tartous; Mersin; Marseilles; Genoa; Valencia; Fos; Leghorn; Tilbury; London; Liverpool; Avonmouth; Birmingham; Manchester; Leeds; Dublin; Belfast; Antwerp; Hamburg; Bremen; Rotterdam; Le Havre; Aarhus; Gothenburg; Helsinburg. (Carting at CFS Cotton Avenue).	16/5
16/5	Olandia	Samrat/ Hindustan/ Merzario	Felixstowe; Hamburg; Rotterdam; Also London; Liverpool; Leixoes; Lisbon; Manchester; Avonmouth; Wembly; Birmingham; Liecester; Le Havre; Bremen; Amsterdam; Antwerp; Copenhagen; Leeds; Aarhus; Gothenburg; Oslo; Helsinki; Stockholm; Belfast and all destinations in U.K., Benelux; Germany; Italy; France; Switzerland and Austria. (Carting at M.O.D. No. 1 for Merzario). (Carting at M.O.D. No. 2 and B. Pier Extn. for Samrat and Hindustan).	22/5
17/5	CMB Merit/	C.M.B.	Djibouti; Port Sudan; Jeddah; La Spezia; Valencia; Genoa; Barcelona;	19/5
21/5	CMB Marque (Nhava Sheva)		Marseilles; Tunis; Casablanca; Tangier; Alexandria; Piraeus; Mersin; Limassol; Felixstowe; London; Liverpool; Manchester; Birmingham; Avonmouth; Dublin and all inland destinations in U.K.; Antwerp; Rotterdam; Hamburg; Bremen; Leixoes; Lisbon; Copenhagen; Oslo; Gothenburg; Stockholm; Malmao; Aarhus; Helsinki. (Carting at Kalamboli)	23/5
15/5	Menkar	P&O	Assab; Djibouti; P Sudan. (Carting at Timber Pond No. 4).	17/5
17/5	Lanka Abhaya (Ger)	Seahorse	Hodeidah; Jeddah; Aqaba (Direct); Felixstowe; London; Liverpool; Manchester; Avonmouth; Dublin; Glasgow; Wembly; Liecester; Immingham; Birmingham; Leeds; Antwerp; Bremen; Copenhagen; Gothenburg; Hamburg; Rotterdam; Oslo; Stockholm; Helsinki; Aarhus; Malmao; Norkopping. (Carting at M.O.D. No. 3).	21/5
21/5	CMB Marque (Nhava Sheva)	C.M.B.	Dar Es Salaam; Mombasa (Direct); Nacala; Tanga; Kampala; Blantyre; Lusaka; Ndola; Matwara; Lilongwe; & all inland destinations in East Africa. (Carting at Kalamboli).	23/5

(1)	(2)	(3)	(4)	(5)
12/5	Paithoon	Seahorse	Port Louis. (Carting at M.O.D. No. 3).	16/5
15/5	Menkar (Cyp)	Arebee/	Dar Es Salaam & Mombasa (Direct); Kampala; Jinja; Toronto; Lugazi; Entebee (Uganda); Kigali (Rwanda); Kitwe; Lusaka; Ndola (Zambia); Lilongwe; Blantyre (Malawi); Maputo; Zanzibar. (Carting at M.J. Cotton Depot).	17/5
		P&O	Mombasa; Dar Es Salaam (Direct); Beira; Mahe and inland destinations in East Africa. (Carting at Timber Pond No. 4).	
15/5	Kamnik (Yug)	Depe	Hongkong; Keelung; Kaohsiung; Kobe; Yokohama; Busan.	22/5
15/5	Maersk Clementine (Sing)(V-9010)	Volkart Fleming	Penang; Singapore; Hongkong; Keelung; Kaohsiung; Busan; Main Japan Ports; Manila; Jakarta; Surabaya; Bangkok; P. Kelang; Chinese Ports. (Carting at M.O.D. No. 2).	20/5
17/5	Lanka Abhaya	Seahorse	Singapore; Penang; P. Kelang; Bangkok; Hongkong; Keelung; Kobe; Yokohama & FCL only Busan; Inchon; Osaka; Tokyo; Nagoya; Kaohsiung. (Carting at M.O.D. No. 4).	21/5
12/5	Eagle Breeze (V-20)(Jap)	F.F.C. Co.	Penang; P. Kelang; Singapore; Bangkok; Jakarta; (T. Priok); Hongkong; Manila; Busan; Keelung; Kaohsiung; Kobe; Yokohama; Nagoya; Osaka; Tokyo; Tsingtao; Dairen; Quangzhou; Whampoa; Shanghai; Hsingkang. (Carting at Timber Pond No. 1).	18/5
12/5	Paithoon (V-35)(Thai)	Samrat/	Singapore (Direct); Penang; Jakarta; Surabaya; Belawan; P. Kelang; Bangkok; Manila; Hongkong; Kaohsiung; Keelung; Taichung; Busan; Yokohama; Nagoya; Kobe; Osaka; Tokyo. (Carting at Mallet Bunder).	16/5
		Trident/	Busan; Hongkong; Keelung; Kobe; Nagoya; Yokohama; Penang; P. Kelang; Bangkok; Kaohsiung; Singapore. (Carting at T.P. No. 4).	
		U.L.A./	Singapore; Penang; P. Kelang; Keelung; Kaohsiung; Bangkok; Busan; Jakarta; Hongkong; Japan and Chinese ports. (Carting at M-171/173 Cotton Depot).	
		E.S.P.L./	Singapore; Hongkong; Bangkok; Jakarta; Kaohsiung; Keelung; Penang; P. Kelang; Kota Kinabulu; Kulaubelati; Bintulu; Kuching; Labuan; Vietnam (P.R.C.). (Carting at M-172 Cotton Depot).	
		I.M.E./	Singapore; Bangkok; Hongkong; Keelung; Busan; Kobe; Yokohama; Nagoya. (Carting at Wadi Bunder No. 3).	
		P&O/	Far East & S.E. Asian Ports. (Carting at Timber Pond No. 4).	
		M.C.S./	Singapore; Hongkong; Keelung; Kaohsiung; Jakarta; Surabaya; Bangkok; Penang; P. Kelang. (Carting at E-Grain Depot).	
		Kanika/	Bangkok; P. Kelang; Djakarta; Keelung; Busan; Hongkong. (Carting at T.P. No. 3).	
		Sarada	Chinese Ports. (Carting at M-172 Cotton Depot).	
12/5	Orient Express (V-114)	Transworld/	Singapore; P. Kelang; Penang; Keelung; Kaohsiung; Busan; Bangkok; Manila; Djakarta. (Carting at CFS Cotton Avenue).	16/5
		N.L.S.	Far East; Japan & Chinese Ports. (Carting at T.P. No. 4).	
16/5	Nortween Merchant	Delta	Far East Ports. (Breakbulk only).	22/5
12/5	Eagle Breeze	F.F.C. Co.	Brisbane; Fremantle; Sydney; Melbourne; Adelaide. (Crtg. at T.P. No. 1).	18/5
17/5	Lanka Abhaya	Seahorse	Brisbane; Fremantle; Sydney; Melbourne; Adelaide. (Carting at M.O.D. No. 3).	21/5
12/5	Paithoon (V-35)	Samrat/	Brisbane; Sydney; Melbourne; Adelaide; Fremantle; Burnie. (Carting at Mallet Bunder).	16/5
		Trident/	Brisbane; Sydney; Melbourne; Adelaide; Fremantle; Burnie; Auckland; Wellington; Lyttleton. (Carting at T.P. No. 4).	
		Arebee/	Sydney; Melbourne; Adelaide; Brisbane. (Carting at M-Jetha C.D.).	
		Transworld/	Sydney; Melbourne; Adelaide; Fremantle; Burnie; Brisbane. (Carting at CFS Cotton Avenue).	
		E.S.P.L./	Sydney; Melbourne; Adelaide; Fremantle. (Carting at M-172 C.D.).	
		Kanika/	Brisbane; Sydney; Melbourne; New Castle; Adelaide; Fremantle; Auckland; Wellington; Lyttleton. (Carting at Timber Pond No. 3).	
15/5	Maersk Clementine	V. Fleming	Dubai; Dammam; Muscat; Bahrain; Kuwait; Riyadh; Doha. (Carting at M.O.D. No. 2).	20/5
12/5	Eagle Breeze (V-20)	F.F.C. Co.	Dubai; Sharjah; Abu Dhabi; Doha; Muscat; Dammam; Riyadh; Bahrain; Kuwait. (Carting at Timber Pond No. 1).	18/5
17/5	Lanka Abhaya	Seahorse	Dubai; Khorfakkan; Sharjah; Muscat; Dammam; Riyadh; Kuwait. (Carting at M.O.D. No. 3).	21/5
21/5	CMB Marque (Nhava Sheva)	C.M.B.	Dubai; Abu Dhabi; Bahrain; Kuwait; Dammam; Doha. (Carting at Kalamboli).	23/5

(1)	(2)	(3)	(4)	(5)
12/5	Orient Express (V-114)(Pan)	Transworld	Sharjah; Dubai; Abu Dhabi; Fujairah; Ajman; Doha; Kuwait; Dammam; Baghdad; Basrah & inland destinations in Gulf. (Carting at CFS Cotton Avenue).	16/5
		Sai Ship/	Dubai; Muscat; Sharjah; Abu Dhabi. (Carting at E-Grain Depot).	
		Worldwide	Dubai; Muscat; Baghdad; Sharjah; Abu Dhabi; Basrah. (Carting at CFS Cotton Avenue).	
13/5	Seacrest Achiever (Ger) (Voy-213)	Penguin/	Dubai; Abu Dhabi; Sharjah; Doha; Muscat; Jebel Ali; Kuwait; Bahrain. (Carting at H.B. No. 4).	19/5
		Sai Ship/	Dubai; Muscat; Sharjah; Abu Dhabi. (Carting at E-Grain Depot).	
		Merzario/	Dubai; Sharjah; Abu Dhabi; Muscat; Doha; Dammam; Kuwait; Bahrain. (Carting at M.O.D. No. 1).	
		L. Triest/	Dubai; Dammam; Riyadh; Muscat; Abu Dhabi; Doha; Kuwait; Bahrain. (Carting at M-171/173 Cotton Depot for L. Triest).	
		Killick/	Dubai; Dammam; Riyadh; Bahrain; Kuwait. (Carting at E-Grain Depot).	
		O.S.A./	Dubai; Abu Dhabi; Bahrain; Doha; Muscat; Kuwait; Dammam. (Carting at M-178/180 Cotton Depot).	
		Seaspeed/	Dubai; Dammam; Bahrain; Kuwait; Doha. (Carting at M-178 C.D.).	
		Kanika/	Dubai; Abu Dhabi; Sharjah; Muscat; Kuwait; Bahrain. (Carting at T.P. No. 3).	
		Parekh	Muscat; Dubai; Sharjah; Abu Dhabi; Basrah; Baghdad; Mosul. (Carting at Timber Pond No. 3).	
12/5	Eagle Breeze	F.F.C. Co.	Colombo; Rangoon. (Carting at Timber Pond No. 1).	18/5
17/5	Lanka Abhaya	Seahorse	Colombo. (Carting at M.O.D. No. 3).	21/5
9/5	Together	Sitara	Karachi. (Afghanistan). (Carting at B-PD).	18/5
17/5	Lanka Abhaya	Seahorse	New York; Baltimore; Charleston; Norfolk. (Carting at M.O.D. No. 3).	21/5
12/5	Paithoon (V-35) (Thai)	Samrat/	Longbeach; Oakland; Seattle; Los Angeles; San Francisco; Philadelphia; Savannah; Charleston; Baltimore; Norfolk; New York; Boston; St. John; Vancouver; Montreal; Toronto; New Orleans; Houston. (Carting at M.B.).	16/5
		U.L.A./	Los Angeles; San Francisco; Oakland; Seattle; Vancouver; Charleston; Houston; Norfolk; Baltimore; New York; Halifax; Montreal; Toronto; West Indies Ports. (Carting at M-171/173 Cotton Depot).	
		E.S.P.L./	Longbeach; Charleston; New York; St. John; Norfolk; Oakland; Vancouver (B.C.); Seattle; Montreal; Baltimore; Boston; Chicago; Dallas; Houston; Longview; Los Angeles; New Orleans; Philadelphia; Portland; San Diego; Mexico City; San Francisco; Siouxfall; Sacramento; Stockton; Halifax; Toronto; Savannah; Taoma; Miami and all other destinations. Also Caribbean ports. (Carting at M-172 C.D.)	
		Trident/	S. American; Caribbean and Central American ports. (Carting at T.P. No. 4)	
		Arebee	S. American Ports. (Carting at M-Jetha Cotton Depot).	
13/5	Seacrest Achiever	Patvolk/P&O/ S.W. & Co./ Trident/	S. American Ports. (Carting at T.P. No. 4 for P&O, S.W. & Co. & Trident) (Carting at Hay Bunder No. 4 for Patvolk).	19/5
		Seaspeed	New York; Norfolk; Savannah; Baltimore; Boston; Charleston; Houston. New York; Baltimore; Norfolk; Savannah; Charleston; Houston and S. American ports. (Carting at M-178 Cotton Depot).	
15/5	Maersk Clementine (Sing)(V-9010)	Volkart Fleming	New York; Philadelphia; Baltimore; Norfolk; Charleston; Savannah; Jacksonville; Miami; New Orleans; Houston; Toronto; Montreal; Chicago; Atlanta; Denver; Dallas; Wilmington; Milwaukee; Detroit; Minneapolis; Memphis; Nashville; Cleveland; Phoenix; Boston; Los Angeles; Vancouver; Seattle; San Francisco; Portland; Longbeach; Mexican & S. American Ports. (Carting at M.O.D. No. 2).	20/5
12/5	Eagle Breeze (V-020)	F.F.C. Co.	Los Angeles (Harbour); Longbeach; San Francisco; Oakland; Seattle; Vancouver (B.C.); Portland; New York; Boston; Norfolk; Baltimore; Charleston; Savannah; Miami; New Orleans; Houston; Montreal; Toronto; Fortworth; Chicago; Nashville; Atlanta; Philadelphia; Milwaukee; Kansas City; Phoenix; Guam; Dallas; Cleveland; St. Louis; Cincinnati; Denver; Louisville; Memphis; Wilmington (BC); San Diego; Minneapolis; Indianapolis and Central American Ports; Honolulu. (Carting at Timber Pond No. 1).	18/5
12/5	Orient Express (Voy-114)	Transworld	New York; Boston; Toronto; Montreal; Philadelphia; Norfolk; Baltimore; Charleston; Savannah; Jacksonville; Miami; New Orleans; Houston; Los Angeles; Longbeach; San Francisco; Oakland; Seattle; Vancouver. (Carting at CFS Cotton Avenue).	16/5

(1)	(2)	(3)	(4)	(5)
17/5 21/5	CMB Merit/ CMB Marque (Nhava Sheva)	C.M.B.	Norfolk; New York; Baltimore; Philadelphia; Charleston; Savannah; Houston; Miami; New Orleans; Via Antwerp; Montreal; Toronto; Halifax. (Carting at Kalamboli).	19/5 23/5
16/5	Olandia	Merzario	Dakar; Abidjan; Monrovia; Lome; Douala; P. Noire; Matadi; Libreville; Cotonou; P. Gentle; Lagos; P. Harcourt; Warri; Freetown; Conakry; Louanda; Nouakchott; Guinea; Blassa. (Carting at M.O.D. No. 1).	22/5
17/5 21/5	CMB Merit./ CMB Marque (Nhava Sheva)	C.M.B.	Lagos; Abidjan; Lome; Douala; Matadi; Port Gentil; Ponte Noire; Nouakchott; Cotonou; Dakar; Luanda; Monrovia; Tema via Antwerp. (Carting at Kalamboli).	19/5 23/5
15/5	Maersk Clementine	V. Fleming	Lagos/Apapa; Dakar; Freetown; Monrovia; Lome; Cotonou; Doula; Tema. (Carting at M.O.D. No. 2).	20/5
12/5	Paithoon	U.L.A./ Trident	Lagos/Apapa; Abidjan; Lome/Matadi. (Carting at M-171/173 C.D.). Tema/Lome; Lagos; Matadi; Lobito; Luanda; Freetown; Cotonou; Douala; P. Harcourt; Abidjan; Monrovia; Dakar. (Crtg. at T.P. No. 4).	16/5
13/5	Seacrest Achiever	Patvolk/P&O/ S.W. & Co./ Seaspeed	West African Ports. (Carting at T.P. No. 4 for P&O and S.W.& Co.) (Carting at Hay Bunder No. 4 for Patvolk). West African Ports. (Carting at M-178 Cotton Depot).	19/5
12/5	Orient Express (V-114)	Transworld	Monrovia; Lome; Lagos; Douala; Tema; Takoradi; Abidjan; San Pedro. (Carting at CFS Cotton Avenue).	16/5
15/5	Menkar	Arebee	Lagos/Apapa; P. Harcourt; Abidjan; Tema; Takoradi; Monrovia; Lome; Freetown; Cotonou; Douala; Matadi. (Carting at M-Jetha C.D.).	17/5

VESSELS DUE FOR IMPORT DISCHARGE

Due Date	Steamer's Name	Agents	From
16/5	Anangel Aries	Parekh	Cont.
17/5	CMB Merit (Nhava Sheva)	C.M.B.	UK Cont./US/Med. Ports.
20/5	Eric F.I.	J.M. Baxi	Cont.
19/5	Ever Bridge (V-30)	Greenways	F. East/U.S.
18/5	Jala Bala	S.C.I.	U.K. Cont.
23/5	Ibn Al Moataz	Transworld	S. America
17/5	Laka Abhaya	Seahorse	U.K. Cont.
16/5	Mulpha Tampin	S.O.T.	Australia
19/5	Ocean Sincerity (V-23A/B)	O.S.A./M.S.P.L.	F. East/U.S./Far East
16/5	Olandia (V-03)	Merzario/Samrat	U.K. Cont.
17/5	Sulu Express	S.C.I.	U.S./Canada
18/5	Sambrine	S.D.S. Corpn.	Far East
16/5	Vishva Nandini	S.C.I.	E. Africa

Materials Imported

MATERIALS IMPORTED
MADRAS
(From 16.2.1990 to 28.2.1990)
(Continued from previous issue)

PHOSPHORIC ACID: From Morocco: Madras Fertilisers Ltd., 7,495 MTs., Rs. 5,30,56,786.

PIPERIDINE: From Japan: Srinivas Chemical Inds., 1,020 Kgs., Rs. 1,05,212.

POLYSAR BUTYL: From Belgium: Suntex Tubes India P. Ltd., 13.299 MTs., Rs. 4,29,824.

POLYSAR CHLOROBUTYL: From Belgium: Suntex Tubes India P. Ltd., 1.023 MTs., Rs. 38,691.

PYRIDINE: From Belgium: IEL Ltd., 30,400 Kgs., Rs. 18,60,532.

SILICON: From Japan: Kalyam Keonics Ltd., 49.42 Kgs., Rs. 22,224.

SILICON DIOXIDE: From Japan: WS Inds. India Ltd., 100 Kgs., Rs. 1,21,675.

SILICON METAL: From Canada: Escorts Ltd., 17,600 Kgs., Rs. 4,24,482.

SILVER CHLORIDE: From UK: High Energy Batteries India Ltd., 660.142 Kgs., Rs. 24,55,980.

SODIUM FORMATE: From Sweden: Tamilnadu Chemical Products Ltd., 180 MTs., Rs. 7,89,089.

SODIUM METAL: From Hungary: Sumitra Pharmls. & Chemicals, 17,400 Kgs., Rs. 2,54,262; From FRG: Inventaa Chemicals Pvt. Ltd., 34,864.3 Kgs., Rs. 5,77,792.

SOLVENT: From Japan: Electronic Research Ltd., 2 Nos., Rs. 1,345.

SOYA LECITHIN: From Singapore: Nova Magnetics Ltd., 181.44 Kgs., Rs. 27,505.

STYRENE BUTADIENE: From China: Dunlop India Ltd., 1,00,800 Kgs., Rs. 15,24,954; From UK: Dunlop India Ltd., 91,184 Kgs., Rs. 12,93,261.

STYRENE OXIDE: From Japan: ICI India Ltd., 5,000 Kgs., Rs. 2,69,414.

ORTHOXYLENE: From Netherlands: Thirumalai Chemicals Ltd., 1,996.184 MTs., Rs. 1,17,36,543.

ZINC ASH: From Netherlands: Metal Investors Pvt. Ltd., 15,240 Kgs., Rs. 2,03,049.

TETRA HYDROFURAN: From USA: Nova Magnetics Ltd., 13,063 Kgs., Rs. 5,39,002.

TETRAMETHYL THIURAM DISULPHIDE: From China: MRF Ltd., 3,000 Kgs., Rs. 1,54,723.

TITANIUM DIOXIDE: From Italy: Quinn India Ltd., 40,000 Kgs., Rs. 18,58,744; From USA: APBC Printing Inks Pvt. Ltd., 15,000 Kgs., Rs. 6,57,574.

TITANIUM DIOXIDE RUTILE: From Singapore: Addisons Paints & Chemicals Ltd., 17,500 Kgs., Rs. 8,11,706.

TITANIUM TETRACHLORIDE: From USA: Sundaram Fasteners Ltd., 150 Lbs., Rs. 42,211.

TRIETHYLENE GLYCOL: From Singapore: Shri Siddhivinayak Enterprises, 18,800 Kgs., Rs. 1,95,536.

3,4,5 TRIMETHOXY BENZALDEHYDE: From China: L.V.R. Exports, 2,000 Kgs., Rs. 8,44,953.

DRUG MATERIALS IMPORTED
MADRAS
(From 16.2.90 to 28.2.90)

D(+)ALPHA PHENYL ETHYLAMINE: From Japan: Cheminor Drugs Limited, 1,800 Kgs., Rs. 11,50,386.

ALPHA PHENYL GLYCINE: From China: TTK Pharma Ltd., 500 Kgs., Rs. 1,59,669.

AMPICILLIN SODIUM STERILE BP: From Hong Kong: TTK Chemical Limited, 100 Kgs., Rs. 1,59,901.

For Your Regular Requirements Of:

PHENOL

Please Contact

SONKAMAL ENTERPRISES

9, Khimji Meghji House, 11/15, Issaji Street,
Vadgadi, Bombay 400 003.

Phones: Office: 330352/344797 Resi.: 6367846

6-AMINO PENICILLINIC ACID: From Sweden: TTK Pharma Ltd., 5,000 Kgs., Rs. 39,15,821.

ERYTHROMYCIN THIOCYANATE: From Italy: Pradeep Drug Co., 707 Kgs., Rs. 6,08,679; From FRG: Pradeep Drug Co., 1,315 Kgs., Rs. 12,26,866.

ETHOXY METHYLENE DIETHYL MALONATE: From FRG: Dr. Reddy's Lab. Ltd., 8,000 Kgs., Rs. 17,32,902.

CALCIUM D PANTOTHENATE: From Japan: Eskayef Ltd., 200 Kgs., Rs. 44,457.

D-CALCIUM PANTOTHENATE USP/BP: From Japan: Remidex Pharma Pvt. Ltd., 500 Kgs., Rs. 1,11,143.

3 CHLORO 4 FLUOROANILINE: From Japan: Tamilnadu Dadha Pharmls., 800 Kgs., Rs. 3,20,449.

CYANAMIDE 50% W/W SD.: From FRG: Eskayef Ltd., 2,000 Kgs., Rs. 1,61,600.

2 CHLORO METHYL PROPIONATE: From UK: Dr. Reddy's Labs Ltd., 16,650 Kgs., Rs. 5,49,578.

GLYCERINE BP: From FRG: Khoday Distilleries Ltd., 5,000 Kgs., Rs. 1,72,551.

L-DOPA: From Hong Kong: Tamilnadu Dadha Pharms. Ltd., 160 Kgs., Rs. 2,46,512.

OXYTHIAZINE JP: From China: Tamilnadu Dadha Pharmls. Ltd., 125 Kgs., Rs. 3,36,038.

TETRA BUTYL AMMONIUM BROMIDE: From USA: Cheminor Drugs Ltd., 2,994 Kgs., Rs. 5,86,598.

3,4,5-TRIMETHOXYBENZALDEHYDE: From France: Coastal Pharma Chemicals, 1,500 Kgs., Rs. 6,06,000; From Netherlands: Savera Laboratories Ltd., 5.040 MTs., Rs. 20,18,830; Prasad Drugs Private Limited, 2,520 Kgs., Rs. 10,09,416.

PARA NITRO CHLOROBENZENE: From Hong Kong: Srinivasa Agro Inds. and Drugs Pvt. Ltd., 19,000 Kgs., Rs. 5,43,526.

PARAHYDROXY PHENYL ACETAMIDE: From Japan: Meridian Pharmls. P. Ltd., 150 Kgs., Rs. 1,30,478.

D-PARA HYDROXY PHENYL GLYCINE: From Singapore: TTK Pharma Ltd., 3,000 Kgs., Rs. 11,34,639.

PROPYLENE GLYCOL BP/USP: From FRG: Bush Boake Allen (I) Ltd., 47,880 Kgs., Rs. 9,46,598.

PROPYLENE GLYCOL USP: From USA: K. Uttamlal (Exports) Ltd., 23,650 Kgs., Rs. 4,16,338.

PLASTIC MATERIALS IMPORTED MADRAS
(From 12.2.90 to 15.2.90)

EPOXY RESIN: From Singapore: V.V. Rama Rao & Co., 2,600 Kgs., Rs. 1,67,617.

HDPE: From Japan: Digvijay Polytex Private Limited, 16,500 Kgs., Rs. 2,71,675; From USA: Earnest Decopack Industries Private Limited, 13 MTs., Rs. 1,51,726; From Korea: Karnataka Filatex, 20 MTs., Rs. 3,12,548; Srijee Udyog, 15 MTs., Rs. 23,23,357.

LDPE: From Singapore: Indo National Ltd., 16 MTs., Rs. 2,55,809.

PVC RESIN: From Japan: UB Mec Batteries Ltd., 14,000 Kgs., Rs. 3,26,129.

POLYESTER/POLYMER CHIPS: From USA: IOCL, 118.86 MTs., Rs. 16,58,405.

POLYETHYLENE GRANULES: From Netherlands: Reddy Exports, 7.950 MTs., Rs. 13,87,002.

POLYPROPYLENE: From Japan: Pioneer Plastics, 15,500 Kgs., Rs. 2,71,675; From Singapore: Polygraphs, 16 MTs., Rs. 2,50,308.

A TRUSTED & PROVEN NAME
TO MEET YOUR REQUIREMENTS OF
SEQUESTERING/CHELATING AGENTS

EDTA

EDTA PURE ACID
EDTA DI SODIUM
EDTA TETRA SODIUM
EDTA TETRA SOLUTION
EDTA FERRIC SODIUM
EDTA FERRIC AMMONIUM
NTA

Contact Manufacturers

New Alliance Dye.Chem.Pvt.Ltd.

Office:
C/o. P.V. Kamat & Co.
12, Khandelwal Bhavan,
166, Dr. D.N. Road, Bombay 400 001.
Phone: 2040024

Factory:
K-63, M.I.D.C. Tarapur,
Post-Boisar, Dt. Thane.
Pin: 401 506

POLYPROPYLENE GRANULES: From Netherlands: Jeddy Exports, 7 MTs., Rs. 1,19,911.

POLYSTYRENE: From Korea: Suryodaya Plastic P. Ltd., 34 MTs., Rs. 7,44,342.

POLYSTYRENE RESIN: From Korea: Beardsell Ltd., 61 MTs., Rs. 11,25,560.

SYNTHETIC RESIN: From USA: MRF Ltd., 5,000 Kgs., Rs. 5,20,043.

PLASTIC MATERIALS IMPORTED MADRAS (From 16.2.90 to 28.2.90)

ACETAL COPOLYMER: From UK: Reed Relays & Electronics (I) Ltd., 1,500 Kgs., Rs. 1,31,128.

HDPE: From Singapore: Primex Polymers, 31.875 MTs., Rs. 4,21,914; From Korea: G.S. Plastics, 16 MTs., Rs. 2,68,951; From Singapore: APL Canpack P. Ltd., 17,000 Kgs., Rs. 3,14,603; From Japan: Aksa Polybags P. Ltd., 16,500 Kgs., Rs. 2,72,398; From UAE: Peacock Polymers (P) Ltd., 51,450 Kgs., Rs. 8,13,742; From Japan: Oriental Plastics Lamination, 33,000 Kgs., Rs. 5,60,006; From Singapore: Aarkay Impex, 8.5 MTs., Rs. 1,13,249; From Japan: Polyspin P. Ltd., 16,500 Kgs., Rs. 2,80,154; From Saudi Arabia: Gumadi Polymers P. Ltd., 33 MTs., Rs. 4,90,661.

POLYACETAL RESIN: From Japan: Zip Inds. P. Ltd., 2,000 Kgs., Rs. 92,934.

POLYBUTADIENE: From FRG: MRF Ltd., 199.564 MTs., Rs. 39,37,676.

POLYETHYLENE: From Singapore: Siva Plastic Inds., 17,000 Kgs., Rs. 2,26,498; From Saudi Arabia: Siva Plastic Inds.,17,000 Kgs., Rs. 2,26,498; From USA: Anand Engg. Udyog, 27.5 MTs., Rs. 3,07,298.

POLYPROPYLENE: From USA: Strofib Plastics Pvt. Ltd., 49.5 MTs., Rs. 6,08,451; From Japan: Swarnarathinam Inds., 15.5 MTs., Rs. 2,49,608; From Singapore: TSP Associates, 16 MTs., Rs. 4,62,981; From Japan: Wonder Plastics, 16,000 Kgs., Rs. 2,49,302; From Japan: Packorema Pvt. Ltd., 15,500 Kgs., Rs. 2,30,595; From Japan: Arun Poly Print Pack, 16,000 Kgs., Rs. 2,48,812; From USA: JK Sayani Enterprises, 17,500 Kgs., Rs. 2,37,673; From Japan: Arun Poly Print Pack, 15,500 Kgs., Rs. 2,42,492; From Japan: Bee Jay Pvt. Ltd., 30,000 Kgs., Rs. 4,50,933.

POLYSTYRENE: From FRG: Revathi Electronics P. Ltd., 175 Kgs., Rs. 56,597; From Korea: Murugappa Electronics Ltd., 17,000 Kgs., Rs. 2,54,262.

POLYSTROL: From Korea: Coney Electronics Pvt. Ltd., 17 MTs., Rs. 2,54,262.

PVC RESIN: From China: Maruti Plastics Udyog P. Ltd., 31 MTs., Rs. 3,80,851; From Belgium: Polywin Industries, 17,000 Kgs., Rs. 2,15,757.

MATERIALS IMPORTED BOMBAY (From 5.3.90 to 7.3.90)

ANISALDEHYDE LINALOOL: From Japan: Indian Plastic Ltd., 6,470 Kgs., Rs. 11,24,945.

AROMATIC CHEMICALS: From Italy: Equipment Spare Parts India, 300 Kgs., Rs. 1,58,559; From Japan: Shah Incense Works, 1,000 Kgs., Rs. 1,95,983.

DIMETHYL CYCLOHEXYLAMINE: From FRG: Elecon Engineering. Company Limited, 960 Kgs., Rs. 82,582.

ETHOXY METHYLENE: From USA: Synthetics & Chemicals Ltd., 4 MTs., Rs. 9,07,710.

GLUTAMIC ACID: From Italy: Equipment Spare Parts India, 18.1 MTs., Rs. 3,31,188.

POTASSIUM & SODIUM HYDROXIDE PELLETS
IN A.R.B.P.& C.P.GRADES
Contact:
V. Tribhovandas
MULCHAND MANSION, SHAMALDAS
GANDHI MARG, BOMBAY-2
Phone: 317208 | Gram: IODOFORM Bombay-2

PLASTICIZERS' CONSUMERS, TRADERS & EXPORTERS

AIMS CHEMICALS PVT. LTD. BARODA

Offers you

— **Most Competitive Rates.**
— **Guaranteed Waterwhite Best Qualities in India.**
— **Prompt & Regular long term supply Commitment.**
— **Packing in new COATED sealed pack Barrels or in Tankers.**

of

1. DI ISO OCTYL PHTHALATE (D.I.O.P.)
2. DI BUTYL PHTHALATE (D.B.P.)
3. DI OCTYL PHTHALATE (D.O.P.)

Contact Manufacturer:

Regd. & Communication Office:

AIMS CHEMICALS PVT. LTD.

33/C, Viharkunj Society, Opp. Vihar Cinema, Pratapnagar Road, Baroda 390 004. (Gujarat)
Phones: 63711, 63160

Factory:
Plot No. 4719, G.I.D.C. Estate, Ankleshwar 393 002, (Gujarat).

ALLYL ALCOHOL
ALLYL CHLORIDE
B.H.A.*
T.B.H.Q.*
B.H.T.
SORBIC ACID
DL MALIC ACID
COCO DIETHANOLAMINE* (IMPORTED)
N-HEPTANE 99%
CALCIUM CHLORIDE
TERT. BUTANOL*
THIOGLYCOLLIC ACID*
TEG (IMP & INDIAN)
ISO PROPYL MYRISTATE (98%, IMPORTED)
ISO PROPYL AMINE 99%*
ACRYLONITRILE
ISO PROPYL ETHER
LITHIUM HYDROXIDE
MOLYBDENUM DISULPHIDE
ISO OCTANE 99%*
N-PENTANE 99%*

Also for **'ATLAS'** brand laboratory chemicals

Contact:

HARIBHAI JEEBHAI & CO.

22, S. Gandhi Marg. (Princess Street), Bombay 400 002
Tel. No.: Off.: 312116-315999-254950-253945 Resi.: 6207314-6207791
Telex: C/o.: 011-3185 ABC INN

* WITH MODVAT

L-GLUTAMIC ACID: From Italy: Equipment Spare Parts India, 500 Kgs., Rs. 81,457.

GUM ROSIN WG GRADE: From Italy: Equipment Spare Parts of India, 18,000 Kgs., Rs. 1,52,723.

HYDROXY PHENYL GLYCINE: From Italy: National Fertilizers Ltd., 1,000 Kgs., Rs. 3,94,321.

ISOPHORONE: From USA: Nicrowin Electronic Ltd., 3,800 Kgs., Rs. 81,006.

ISOPROPYL MYRISTATE: From USA: Divya Fertilizers Pvt. Ltd., 1,080 Kgs., Rs. 60,114.

LINALOOL: From Sweden: The New Ball Bearing Co., 875 Kgs., Rs. 1,45,415.

LITHIUM CARBONATE TECH.: From Japan: Indian Plastic Ltd., 1,100 Lbs., Rs. 37,821.

L-LYSINE MONO HCl: From Italy: Equipment Spare Parts India, 2,500 Kgs., Rs. 1,50,856.

METHYL DICHLORO ACETATE: From Japan: Themis Agencies, 3,000 Kgs., Rs. 1,10,182.

NEOPENTYL GLYCOL: From Italy: Equipment Spare Parts India, 4,000 Kgs., Rs. 1,01,692.

PARA OCTYL PHENOL: From Japan: Indian Plastics Ltd., 5,000 Kgs., Rs. 1,16,043.

POLYVINYL BUTYRAL RESIN: From Italy: Equipment Spare Parts India, 300 Kgs., Rs. 35,066.

PROPIONIC ANHYDRIDE: From Japan: Mehta Pharmaceutical Inds., 900 Kgs., Rs. 38,925.

STYRENE MONOMER: From USA: Divya Fertilizers P. Ltd., 17,600 Kgs., Rs. 2,91,980.

DRUG MATERIALS IMPORTED BOMBAY (From 5.3.90 to 7.3.90)

D(-) ALPHA PHENYL GLYCINE CHLORIDE: From Netherlands: Scanomex India Ltd., 1,015 Kgs., Rs. 4,27,153.

D-CALCIUM PANTOTHENATE: From Japan: Bombay Pharma Products, 500 Kgs., Rs. 1,14,409.

CITRIC ACID MONO BP 80: From Italy: National Fertilizers Ltd., 20,000 Kgs., Rs. 3,02,226; From USA: Synthetics & Chemicals Ltd., 20 MTs., Rs. 3,00,851.

ERYTHROMYCIN THIOCYANATE: From Italy: National Fertilizers Ltd., 200 Kgs., Rs. 1,78,860.

GLYCEROL MONO STEARATE BP 80: From Italy: Equipment Spare Parts India, 13,000 Kgs., Rs. 1,57,876.

IODINE CRUDE: From FRG: Shree Cement Ltd., 1,500 Kgs., Rs. 4,43,540.

LACTIC ACID BP 80: From Japan: Manish Traders, 3,108 Kgs., Rs. 80,147.

PLASTIC MATERIALS IMPORTED BOMBAY (From 5.3.90 to 7.3.90)

HDPE: From Hungary: Jay Corp., 15.750 MTs., Rs. 1,74,875; From FRG: Shree Cement Ltd., 1,40,050 Kgs., Rs. 17,97,364.

POLYSTYRENE: From Italy: Equipment Spare Parts India, 12 MTs., Rs. 2,83,977.

POLYSTYRENE FILM: From Italy: Equipment Spare Parts India, 26,334 Kgs., Rs. 1,28,515.

PVC RESIN: From UK: Deepak Trading Co., 17.5 MTs., Rs. 1,93,117.

SYNTHETIC NITRILE RUBBER: From Italy: National Fertilizers Ltd., 6,390 Kgs., Rs. 2,73,246.

MATERIALS IMPORTED BOMBAY (9.3.90)

ACRYLAMIDE: From Japan: Co-

YEAST EXTRACT PASTE AND POWDER

Yeast Extract is an excellent source of Protein, B-Vitamins and essential Amino Acids.

Yeast Extract can be effectively used as nutrient and flavour carrier in items such as: Medicated tonics • Soups, processed snacks and savouries • Dietary preparations • Baby food.

Yeast Extract is most suitable for inclusion in microbial growth media for diagnostic and fermentation purposes.

TYPICAL ANALYSIS OF YEAST EXTRACT

Contents	Unit	VALUE YE Paste (High Salt)	YE Paste (Low Salt)	YE Powder
Dry Matter	%	71.0	71.0	93.0
Amino Nitrogen	%	3.5	4.2	5.5
Total Protein	%	43	53.0	72.3
Water Solution	5%	Clear	Clear	Clear
Copper	mg/100 gm	-	11.0	14.5
Iron	mg/100 gm	-	18.0	23.5
Vitamins				
B1	mcg/g	40.0	53.0	70.0
B2	mcg/g	25.0	33.0	43.5
B6	mcg/g	15.0	16.5	21.8
Pantothenic Acid	mcg/g	80.9	112.8	148.5
Niacine	mcg/g	150.0	236.8	313.0

THE INDIAN YEAST CO. LTD.

Bombay: 3, Walchand Hirachand Marg, Pin 400 038. Tel: 263643/267721
New Delhi: Gulab Bhawan, 6 Bahadur Shah Zafar Marg, Pin 110 001 Tel: 3317732
Madras: 166 Thambu Chetty Street, Pin 600 001 Tel: 589021
Calcutta: 4 Bankshall Street, Pin 700 001 Tel: 289151/285601

Distributors/Agents interested in bulk quantities may also get in touch

lour Chem Ltd., 12,000 Kgs., Rs. 3,09,447; From Japan: Indofil Chemicals Co., 1,000 Kgs., Rs. 25,787; From Japan: Shree Ambica Minerals, 2,000 Kgs., Rs. 51,575.

ANTIMONY TRIOXIDE: From Japan: Bhansali Engineering Polymers, 1,900 Kgs., Rs. 1,56,182; From Belgium: Sylvania & Laxman Ltd., 500 Kgs., Rs. 47,364.

ATRAZINE TECH.: From USA: Rallis India Ltd., 34,560 Kgs., Rs. 18,11,131.

CARBON BLACK: From FRG: Ceat Ltd., 1,000 Kgs., Rs. 28,843.

(CHLORO-2-PHENYL) 3 METHYL-5-ISOXAZOLYL CARBONYL CHLORIDE: From Italy: Kopran Chemical Co. Ltd., 500 Kgs., Rs. 2,79,362.

CITRONELLA OIL: From Korea: Hindustan Lever Ltd., 28.8 MTs., Rs. 16,31,404.

COCO DIETHANOLAMIDE: From Philippines: Ajay Metachem Pvt. Ltd., 2 MTs., Rs. 52,434.

CYCLOHEXYL ISOCYANATE: From FRG: Hoechst India Ltd., 800 Kgs., Rs. 1,97,547.

4-CYANOPYRIDINE: From USA: Mehta Pharml. Inds., 17 MTs., Rs. 13,47,297.

2-CYANO PYRAZINE: From Japan: Nivedita Chemicals P. Ltd., 1,000 Kgs., Rs. 6,04,067.

2-CYANO PYRAZINE 99%: From Japan: Suchem Laboratories, 1,000 Kgs., Rs. 5,93,194.

CYSTEAMINE HYDROCHLORIDE: From Japan: Ranbaxy Laboratories Ltd., 2,000 Kgs., Rs. 3,50,706.

DIBUTYL TIN OXIDE: From USA: Marpol Chemicals Pvt. Ltd., 50 Kgs., Rs. 17,957.

DIMETHYL FORMAMIDE: From Japan: Bhor Inds. Ltd., 15.2 MTs., Rs. 2,61,311.

FURFURYL ALCOHOL: From Belgium: Paramount Chemiequip Private Limited, 8,000 Kgs., Rs. 2,50,920.

GAMMA FERRIC OXIDE: From Japan: Melody Magnetics Private Limited, 8,000 Kgs., Rs. 2,50,920.

GUM ROSIN: From Singapore: Associated Pulp & Paper Mills, 16.330 MTs., Rs. 1,45,982; From China: Quality Products (India) Ltd., 35,100 Kgs., Rs. 3,07,745.

GUM ROSIN LG: From Indonesia: Star Paper Mills Ltd., 54 MTs., Rs. 4,64,698.

HYDRAZINE HYDRATE: From Japan: Hindustan Ciba Geigy Ltd., 2,000 Kgs., Rs. 89,396.

IMINO DIACETIC ACID: From Japan: Excel Inds. Ltd., 10,800 Kgs., Rs. 11,03,848.

MAGNESIUM SULPHATE: From Japan: Bhansali Engg. Polymers, 88,000 Kgs., Rs. 7,07,838.

2-METHOXY 2,3 DIHYDRO 4 PYRAN: From FRG: BASF India Ltd., 15,200 Kgs., Rs. 8,69,126.

MONOMETHYL ACETO ACETAMIDE: From Japan: Sudarshan Chemical Industries, 16,000 Kgs., Rs. 4,05,933.

PARA CUMIDINE: From Japan: Montari Industries Ltd., 76,000 Kgs., Rs. 56,46,820.

PHENYL TRICHLORO SILANE: From Japan:: Dr. Beck & Co. (I) Ltd., 2,000 Kgs., Rs. 2,29,545.

PYRIDINE 2 DEG.: From Japan: Jayendrakumar Hiralal Kharwala, 11,700 Kgs., Rs. 7,39,269.

PROPIONIC ACID: From FRG: S.H. Kelkar & Co. Ltd., 5,040 Kgs., Rs. 86,710.

POTASSIUM CHLORIDE: From Canada: Atul Products Ltd., 240 MTs., Rs. 8,52,481.

ATTENTION EXPORTERS
AVAILABLE SPARE CAPACITY FOR

REMAZOL and REACTIVE DYES

PLEASE CONTACT MANUFACTURERS:

TIME CHEMICALS PVT. LTD.

"Hari-Ichha",
A-23/92, Rajawadi Coop. Housing Society,
Rajawadi, Bombay 400 077.
Telephone No. Off.: 5121709
Resl.: 5121246/5123597

BENZOYL PEROXIDE

We supply Excellent Quality
Quality Cautious Consumers for your Bulk Requirement

Contact Manufacturers

ROMA CHEM INDUSTRIES

Regd. Office: 22/1044, Punjabi Colony,
G.T.B. Nagar, Bombay 400 037.
Phones: 4073074/4092216/4093914 Resi: 483095

Sales Office: Municipal Bldg., C-1, Shop No. 2 & 3,
Near Sardar Nagar No. 4, G.T.B. Nagar, Bombay 400 037.

For Your Requirements Of:

Di Octyl Phthalate (D.O.P.)
Di Butyl Phthalate (D.B.P.)
Di Butyl Maleate (D.B.M.)
Di Octyl Maleate (D.O.M.)
Di Octyl Adipate (D.O.A.)
Butyl Stearate

Please Contact Manufacturers:

SAVITA ORGANIC CHEMICAL INDUSTRIES

1218, Dalamal Tower, Plot No. 211, Nariman Point, Bombay 400 021.
Phone: 230006, 231192, 233554, 233562

READILY AVAILABLE

M.E.K. PEROXIDE	METHYL ETHYL KETONE PEROXIDE
B.P. POWDER	BENZOYL PEROXIDE POWDER
B.P. PASTE	BENZOYL PEROXIDE PASTE
T.B.H.P.	TERTIARY BUTYL HYDRO PEROXIDE
D.T.B.P.	DI TERT BUTYL PEROXIDE
T.B.P.B.	TERTIARY BUTYL PER BENZOATE
L.P.O.	LAURYL PEROXIDE
C.H.P.	CYCLO HEXANONE PEROXIDE

Please Contact:

SHEIRAJ CHEMICALS & PHARMACEUTICALS PVT. LTD.

Office: 503-A, Stock Exchange Building, 5th Floor, Dalal Street, Bombay 400 023.
Phone: 272451/275545. Telex: 5900 GURU IN.
Factory: W-265, T.T.C. Industrial Area, Rabale, Thane (M.S.)

AMMONIUM MOLYBDATE
CALCIUM NITRATE
CALCIUM STEARATE
COBALT SULPHATE
MANGANESE SULPHATE
NICKEL SULPHATE/CHLORIDE
POTASSIUM BROMATE/BROMIDE
POTASSIUM IODIDE/IODATE
STRONGIUM CHLORIDE
ZINC SULPHATE

L C TRADERS
(Chemicals Division)
403, "YOGESHWAR"
135/139, Kazi Sayed Street, Bombay 3.
Tel.: Off.: 331195/326542
Grams: "SULPHATES" — Chinch Bunder

Consumers & Exporters
CONTACT FOR YOUR REQUIREMENTS OF:

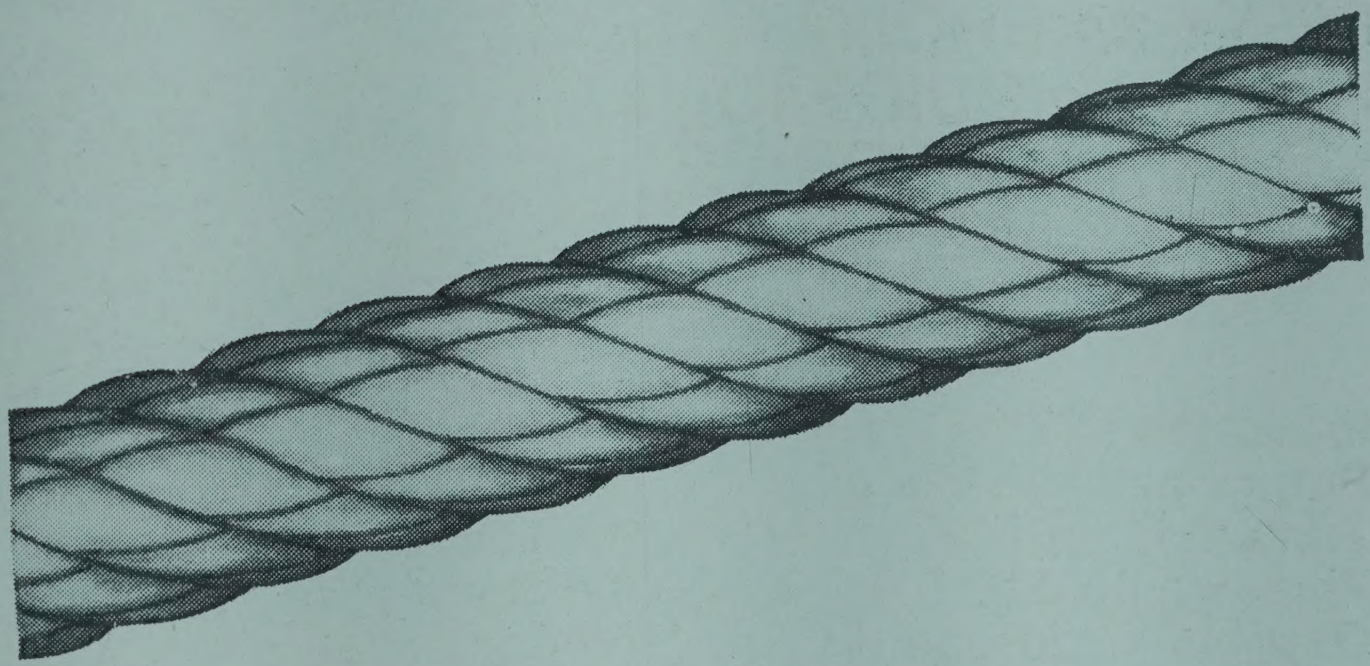
Ibuprofen I.P.	Analgin I.P.
Sulphamethoxazole I.P.	Metronidazole I.P.
Trimethoprim I.P.	Diloxanide Furoate I.P.
Paracetamol I.P.	Saccharine Sodium I.P.
Oxyphen Butazone I.P.	Aluminium Hydroxide I.P.
PTS Amide	Aluminium Chloride

NAV BHARAT MINERALS & CHEMICALS
8, Haresh Chambers, 313/319, Samuel Street, Bombay-400 003.
Phones: 320510 * 332261 * 343429

CALCIUM CHLORIDE
BARIUM CHLORIDE
BARIUM CARBONATE
MAGNESIUM CHLORIDE
POTASSIUM CARBONATE
RESIST SALT
SODIUM SULPHIDE

VORA GHEMI TRADE PVT. LTD.
265, Samuel Street, Bombay 400 003.
Phones: 333762/63/64/325265/345377

TAKE THE DETERMINED LINE



When you let Maersk Line take care of your cargo you get more than 4,000 dedicated professionals at your service.

You get vessels, ports, berths, offices and containers fully controlled by Maersk Line at your disposal. You get access to a gigantic information network supplying you with relevant data about your cargo — whenever you want it

And you get the spirit of Maersk Line: the will, determination and ability to solve any problem and keep any promise.

So experience the art of fine transportation. Let the Determined Line help you provide an even better service for your customers.

MAERSK LINE

..SERVICE ALL THE WAY!

General Agents in India for MAERSK LINE

VOLKART FLEMING SHIPPING & SERVICES LTD.

Bombay (Phone: 2040151) | New Delhi (Phone: 3315218) | Calcutta (Phone: 293683) | Madras (Phone: 522598)

Edited by R. Raghavan and published by N.R. Rajagopalan on behalf of owners, Sevak Publications, 306, Shri Hanuman Industrial Estate, Wadala, Bombay 400 031. Madras Office: Room No. 9, Wellingdon Estate, 3rd Floor, 24, Commander-in-Chief Road, Madras 600 105. Phone: C/o. 471659 and printed by N.R. Rajagopalan at Sevak Publications, 25, North Mada Street, Thiruvanmiyur, Madras 600 041. Phone: 419265. Registered with the Registrar of Newspapers for India vide No. R.N. 1972/57.

REGD. NO. TN/MS (C) 395 ISSN 0045/6500 R.N. NO. 1972/57

Everything about
Precion H-E Dyes
is simply excellent.

- **Excellent level-dyeing properties**
- **Excellent compatibility**
- **Excellent washing-off properties**

Procion H-E Dyes are versatile in exhaust dyeing. They are simply way ahead. An excellent blend of features and benefits, these dyes come to you from Atic—the Company with decades of experience in dye-making.

H-E Dyes for minimum inventory

For further details contact:
Atic Industries Ltd.,
Post Atul 396 020,
Dist. Valsad, Gujarat State.

arninar/ATIC-69-2